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ABSTRACT

The "semester system" in Indian universities was examined in terms of why the system traditionally has not been working and what recommendations could be made to improve it. Part of the ineffectiveness was due to the fact that the design was "ad hoc" and arbitrary, hurriedly imposed upon inadequately prepared or informed teachers, students, and administrators. A new design was drawn up through the use of questionnaires distributed to teachers from various universities in different disciplines, and teacher recommendations were used to plan a revised semester system. It was assumed that if teachers felt they had a part in the design, they would be more likely to implement it, since semester system design has an effect on the syllabus, teaching, learning, and evaluation. Suggestions are given for implementation and evaluation procedures, and the possible alternatives. (PJM)

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# Monograph On Semester System for Universities

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# FOREWORD

Except for a few, most of the universities/institutions in the country, are still persisting with traditional methods of Teaching/Learning/Evaluation in different courses. No systematic thinking has gone into issues related to improvement of Teaching/Learning/Evaluation methods in respect of defining objectives;scope and nature of method to be undertaken, formulating valid and reliable methods of measurement of achievement of these objectives, implementing and evaluating in different universities/colleges.

Prof. Natarajan, in this extremely useful research project, has attempted to get a large number of teachers teaching different subject areas in universities, to respond to a series of issues related to scope and nature, objectives, assessment methods, syllabus analysis, teaching-learning activities, evaluation techniques and so on in the form of a well designed questionnaire on 'Semester System' using a 3 point scale response pattern.

It is to be said here that the problem relating to improvement of Teaching/Learning/Evaluation methods of a university/college is an open ended problem and each university/college has to look at it with the help of a large number of teachers in that university/college and come up with alternatives and finally arrive at an alternative that will work with them in their respective situations. It is not proposed to offer a ready-made solution to all universities.

However, responses from teachers from one university have been analysed to show how a semester system design can be done and a modus operandi of a system of Teaching/Learning/Evaluation arrived at. It is felt that universities/institutions wishing to design improved and scientific methods of system of Teaching/Learning/Evaluation, might do so using the questionnaire and their own teachers to respond to it.

It is also hoped to periodically solicit the views to the questionnaire to obtain more illumination in the light of experiences. It is felt that the teaching community will welcome this monograph and find it useful.

I.J. Patel
Vice-Chancellor
Gujarat Agricultural University

Ahmedabad,
Dated 20.3.1979

# PREFACE

In the recent past, few universities and other institutions in our country, introduced 'semester' system for their courses in place of the usual, traditional, 'annual' systems. Very often, the design of such semester systems has been 'adhoc' and 'arbitrary' and occasionally based on 'foreign models' implanted into ours. Even the basic principles underlying the design and implementation of semester system have not been understood. No clearcut goals & objectives were set forth; syllabus requirements, implications on Teaching/Learning/Evaluation were all half heartedly looked at. The most glaring mistake committed in some cases was that 'an annual' syllabus was first scissored into two halves to generate syllabuses for two semesters in a year. Quite expectedly, constraints and restraints were also not considered as a result of which the implementation was not successful and atleast it did not yield all that they thought it would. In many instances adequate preparations on the part of teachers, students, administrators to understand the new system and its implication, was not made with the result, some of them had to give up 'semester system'. At the same time, a few universities did design carefully; prepare their teachers through training workshops; select a few Colleges affiliated to it to try and evaluate and it is in these universities semester system has come to stay on.

One other basic reason why 'Semester' system failed in few cases was that it was introduced in a great hurry, not to speak of inadequate preparation of teachers, students, administrators but due to inadequate information about it as well. 'Semester system' is an open ended problem and there can be many solutions; a particular solution will apply successfully in one situation while it may not apply in another. A systems approach is to be applied to design, workout details for implementation, evaluation; feed-back and the like.

In this illuminative research project on semester system, consisting of 5 stages of work, an attempt has been made to collect information regarding semester system operation in universities and this is dealt with in Section II 'Development so far'.

The design of semester system is attempted with the help of a carefully and scientifically created questionnaire involving teachers (who are operators and eventually implementors of the semester system) from various universities belonging to different disciplines. Every teacher is asked to respond to a series of 'design' questions and individual responses from teachers belonging to one particular discipline put together to work out a 'consensus'. Every teacher now feels that he/she is participating in 'decision making' and in 'designing'. This has more chance of acceptance and implementation by them. The section on 'Design of semester system' illustrates the use of the questionnaire on pilot basis and also illustrates the method of working out a consensus and developing a design of semester system in various desciplines. The purpose of this section is to indicate to the reader, the procedure that he may adopt to design a semester system in his own discipline.

The following sections deal with the implications of such a semester system on syllabus, teaching, learning and evaluation. Syllabus writing has to undergo a change, teaching/learning methods and experiences must be different from traditional lecturing alone; evaluation must be both formative and summative. Semester system when implemented in the way envisaged in this Monograph has a lot of implications for administration. This may range from changes to be brought in rigid, traditional timetabling, scheduling, rearranging facilities like classroom/laboratory/library/field work and also changes in the functions and life styles of examination sections. Papers for end semester examinations (a good number of them) are to be set in quick time and evaluated equally quickly and results announced. This calls for change in paper setting, evaluating, moderating and result announcing aspects of jobs of university examination sections.

A section dealing with implementation and evaluation of semester system indicates procedures to be adopted and alternatives that can be chosen. The future of semester system depends not only on scientific and rational designs but certainly on the skills and competence of teachers and the attitudes of teachers, parents, administrators to this.

It is hoped that this attempt at a scientific and rational design of semester system will clarify some of the long standing doubts and misgivings and pave the way for more and more universities/institutions to come forward to design on these lines and implement and succeed and thus make higher education meaningful, purposeful and relevant.

New Delhi
23rd March, 1979

V. Natarajan
Author

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# SECTION ONE

# INTRODUCTION

# INTRODUCTION

From time to time every educational system has come in for some criticism or the other. This has happened in educationally developed countries of the world and it is happening in developing countries now. While there are many criticisms advanced the major concern has been the system's inability to produce relevant and meaningful products who can be employed in trade, commerce business, industry or in society in general. Most of the committees and commissions that have deliberated on educational systems in various countries have come out boldly with this criticism and suggested remedies periodically. There can be little doubt that considering the enormous investment made on education at all levels in these countries, some of these criticisms are valid and need to be taken seriously.

Education, like many other professions, has its researchers and operators. But what education does not have is 'the engineer' who translates research into improved 'operations'. The design of an educational system is the area in which this engineer can make one of the most significant contributions. One other reason, why Education (particularly Higher Education) leaves itself open to such outbursts is that it has lagged behind in applying modern management techniques to provide answers to some of its problems. Whether we consider (at the macro level) the design of an educational system to be meeting the present day needs, embodying well defined goals and objectives, or at the micro level, the design of a grading system as a part of the subsystem of examinations within an educational system, it can be shown that a technique like 'systems approach' gives much promise. In this systems approach, a thorough analysis of a system or subsystem may be undertaken. This may be of an existing system which is not satisfactory. There may be certain signposts of dissatisfaction that can be studied and thus a NEED can be established for improving the existing system or designing a new system. Certain constraints that prevent such improvement or new design can also be listed with the idea that in implementation, these can be taken into account. The Goals and Objectives of the improved system or new system are clearly spelt out and it will then be possible to suggest alternatives that are all equally feasible. The systems design has this advantage that it is able to generate alternative solutions and it will then be necessary to select one alternative for trial implementation. This is implemented and evaluated and the feed back information used to modify and improve the design of the system.

Thus, this 'systems' approach is not particularly new and indeed it would be more correct to talk of systems approaches for these vary from sophisticated developments based on cybernetics to the relatively simple systematic development of a section of the curriculum. This can be done at the 'Macro' level to design or improve an educational system as a whole or at the 'Micro' level to design or improve a curriculum. All these, however, share a belief in a 'scientific method', in a rational step by step approach to problem solving, involving testing and refinement until the course is known to meet the educational objectives.

In this monograph an attempt is made to use 'systems approach' to the design of a semester system so that there is science and rationality in the design and on top of these the implementation of the system is smooth and fruitful.

In the past, very few universities and other institutions in the country introduced 'semester' system for their courses in place of the usual, traditional 'annual' systems. Very often the design of such semester systems has been adhoc and arbitrary and occasionally based on 'foreign models' implanted into ours. The basic and fundamental principles have not been understood and taken into account and clearcut, specific goals and objectives are not set forth. Quite expectedly, constraints and restraints were not considered as a result of which the implementation was not successful and at least did not yield all that they thought it would. Certainly in some universities/institutions, this has succeeded to some extent and all these are discussed in section on 'Development so far'. The idea behind this section is that this will provide enough information regarding success and failure so that any new design can take them into account.

One of the basic reasons why the 'semester' system has failed is that the system has not been designed with a scientific 'systems approach', a technique that is explained in detail in Section Three of this Monograph. This section deals with 'systems thinking', 'systems analysis' and systems approach' to solving educational and training problems in general and 'semester system design' in particular. Various accepted steps in the design are explained and illustrated with the design of 'semester system!

Section Four is more pointed and specific in the sense that clear-cut specific goals and objectives for semester system are set forth. It seems reasonable to believe that an educational programme has more chance of being effective if its purposes have been clearly expressed. Experimental research in the field of evaluation indicates that it is not possible to measure the results obtained from an educational system if its objectives have not been explicitly defined. Once these goals and objectives are accepted the design can be done scientifically.

The design of semester system is attempted with the help of a carefully and scientifically created questionnaire involving teachers (who are operators and eventually implementors of the semester system) from various universities belonging to different disciplines. Every teacher is asked to respond to a series of design questions and individual responses from teachers belonging to a particular descipline put together to work out a consensus. This is given back to the group and the psychology used here is simple: every teacher feels (he certainly is) that he is participating in the decision making and that he is an active participant. This solution has more chance of being accepted and implemented faithfully by them. The section on 'Design of the Semester System' illustrates the use of the questionnaire on a pilot basis and also illustrates the method of working out a consensus and developing a design of semester system in various disciplines. The purpose of this section is to indicate to the reader the procedure that he may adopt to design a semester system in his own discipline. The design report on the semester system design includes details like:

1. Need
2. Constraints and Restraints

3. Goals and Objectives
4. Alternatives
5. Selection
6. Implementation
7. Evaluation
8. Refinement

in respect of the proposed design of the semester system. From the responses of teachers, the design is worked out and summarised in this section.

The following sections deal with the implications of such a semester system on syllabus, teaching and learning and evaluation. It can be seen that the syllabus as of now for the annual system leaves a lot to be desired. The syllabus document is a crucial document and in its preparation very often arbitrariness, haste and unrealistic thinking dominate. It may sound ironical, but the fact remains that the process of producing such a document is being given superficial consideration. This process has been mostly segmental, highly casual and often ad-hoc. With this kind of casual approach to one of the dominating elements, the casualities are the teaching performance of the teachers and the learning attainment of the students. Moreover, very often the syllabus does not specify even the content areas fully and clearly. In addition, the syllabus fails to indicate the intellectual abilities and skills to be developed by students. In fact, the syllabus as it obtains now is extremely inadequate. One of the implications of a new system like 'semester system' for courses is that this document 'syllabus' be more carefully and scientifically prepared to specify clearly,

a. all subject matter to be taught
b. activities of students
c. link with other subjects
d. breadth and depth of treatment
e. industrial, live and practical examples of applications of subject matter.
f. students' abilities to be developed
g. students' information and skills to be developed
h. teacher's method of teaching
i teaching/learning aids

j. time allocation
k. classroom organisations, lesson planning, evaluation
l. type, frequency of tests

Once this is done, the syllabus becomes 'dynamic' and into the preparation of such a syllabus in any subject goes a lot of scientific, psychological and educational thinking. For example, the syllabus in the earlier semesters may have a dominating information and comprehension of information element while the later syllabuses in the same subject may involve application, synthesis, analysis etc. The earlier semester topics may be simple, developing into more and more complex topics in the later semesters; there will be continuity in the syllabus for various semesters in the same subject etc. The implication for Teaching/Learning/Evaluation is to be thoroughly and clearly understood. One of the basic ideas is that in respect of teaching, it is not meant to 'cover' the syllabus; but more to 'uncover' it so that students 'discover' the subject content. The methodology of teaching must lay a lot of emphasis on effective learning characterized by attainment or achievement of specific objectives. The methods adopted must build in principles like:

1. active involvement and participation of students in the learning process.
2. immediate knowledge of correct answers to tasks producing positive reinforcement and motivating further learning.
3. a variety of teacher/student activities resulting out of specific objectives.
4. encouragment of correct responses and correction of wrong responses.

More emphasis or infact a shift in emphasis from teacher to learner; teaching to learning, teaching methods to learning strategies, teacher dominated approach to learner centred approach, teacher aims to learning objectives etc., must be built in all the presentation methods. Methods and media must be chosen to suit the instructional objectives so that there is a reasonable chance that all of them are given opportunities to achieve the objectives. The implication for evaluation is obvious; evaluation methods, tools, types, etc. must be based on the instructional objectives. All these are clearly brought out in this section on "Implications for Syllabus, Teaching/Learning and Evaluation."

The semester system when implemented in the way envisaged here, has a lot of implications for administration. This may range from changes to be brought into rigid, traditional time-tabling, scheduling, rearranging facilities like classroom, laboratory, library, field etc, to the functions and styles of examination units of universities/institutions etc. Papers (a good number of them) are to be set in quick time and evaluated equally quickly and results announced. This calls for changes in papersetting, evaluating, moderating and result announcing aspects of jobs of university sections. Use of Question Bank books and similar sources, central setting up of papers during a workshop for paper setting, central evaluation etc. can all be thought of. The implication of a semester system with regard to the functions of teachers, students, parents, administrators must be understood and made clear before the introduction of semester system. On an experimental basis, in the case of affiliating type of universities, a few colleges may be selected for implementation of the semester system. These colleges may be the lead colleges where there is a progressive and forward looking and hardworking faculty, good motivated students, good physical facilities, etc. The results of implementation and evaluation may be studied and this 'feedback' will help modify the design for better performance in subsequent years.

Teachers have to be trained to adopt the semester system. Any change like this is usually resisted because it calls for greater and more sustained work; on top of that, it has to be proved that:

a. the changed system is better than the old system (not only that but shown to be better)

b. the changed system is acceptable to all of them

c. they are trained to produce the changes.

The future of the semester system depends not only on scientific and rational designs but ultimately on the skills and competence of teachers and the attitudes of students, parents and administrators to the change. This is brought out in the last section.

It is hoped that this attempt at a scientific and rational design of semester system will clarify some of the long standing doubts and misgivings and pave the way for more and more universities/institutions to come forward to adopt the system on these lines and thus make higher education purposeful and relevant.

## SECTION TWO

## DEVELOPMENTS SO FAR

## DEVELOPMENTS SO FAR

Examinations in our educational set-up have become an object of 'terror' to the students. Educationists have long been exercised about the examination system as it obtains now in our universities. There has been loud thinking on the subject and a number of seminars and work-shops have been held for exploring ways and means of bringing about positive improvement.

However, the improvements adopted have not always proved to be effective. It is in this context that certain pertinent questions have to be posed, thereby tracing the course of development. What concrete steps have been taken by the authorities in control of higher education to make examinations objective? Has there been any indepth research on the methodology of restructuring the examination system?

As far back as 1949 the Report of the University Education Commission, under the chairmanship of the late Dr. S. Radhakrishnan, mentioned significantly that our examination system was one of the most serious weaknesses of our university education. In the year 1957, the All India Council for Secondary Education sponsored some seminars, with the help of an expert, Dr. Benjamin S. Bloom of Chicago University, who recommended the setting up of a Central Examination Unit attached to the National Institute of Education in order to co-ordinate projects concerned with examination reforms.

Dr. Walker H. Hill of the Michigan State university was one of the consultants who assisted the National Institute of Education from 1963 to 1967. The Boards of Secondary Education in many states utilised the services of the unit for introducing improvements in their examination system. It is somewhat odd that the examination reforms at the university level have taken more time to materialise.

In 1958, a concrete step in this direction was taken by the University Grants Commission (UGC) when it secured the services of Dr. Bloom to conduct a series of seminars on the subject. The UGC also appointed a committee of experts in different subjects in humanities, social sciences, sciences and some professional subjects to review and assess the development in particular branches of knowledge, survey the existing arrangements, recommend measures for the improvement of standards of teaching and research and suggest model syllabuses. The report of the committee underlined the fact that "teaching, learning and examinations constitute a unity of functions" and suggested various measures for the reform of the examination system by bringing about radical changes in the courses of study.

The Education Commission (1964-66) also stressed the need to improve teaching and evaluation methods and to introduce an element of flexibility in the selection of courses so that students have more freedom of choice and the present tendency to memorise mere information is drastically reduced. A suggestion that had been put forward in order to realize some of the above mentioned objectives was the introduction of the Semester System. It was felt that the introduction of this system, if carried out in a co-ordinated and systematic manner, was likely to initiate a process of modernisation and improvement in both teaching and learning processes, apart from bringing about the much needed reform and flexibility in course content and techniques of evaluation.

The committee met on 8th November, 1968 in New Delhi and desired that Dr. R.K. Singh, Prof. Rais Ahmed, Dr. K. L. Vig, Dr. N.K. Ananta Rao and Dr. G. Rangaswamy, be requested to send papers based on their experience of the introduction of the semester system. In its report on "University Teaching Methods" a reference was made to two systems, one involving frequent examinations and the other assessment by an examination covering the whole of the under-graduate and post-graduate courses in the last term. They marked a two way direction of our educational policy. It is only when our Universities are well conversant with both the systems that they can make a conscious choice. It may be advisable for some of the universities to continue with the modified traditional pattern under which examinations are held at the end of the course and for others to adopt the system of frequent examinations in fragmented courses.

Once the word "pattern" or "system" is used, the image of a complex structure, consisting of essential components, is formed. With the semester system have come to be associated the Internal Evaluation and the Grade System, a device to place students into categories on the basis of their achievement. Although the relationship between these and the semester system is only accidental, yet largely because of their reproductions as one whole in I. I. Ts and Agricultural Universities, internal evaluation and grade system have been taken as integral parts of the semester system. This confused thinking had been responsible for the belief that the semester system cannot be introduced in an affiliating type of university.

A little reflection should suggest that it is a case of concomitance and not one of integral relationship. Internal evaluation and award of grades can certainly be introduced in the universities with longer courses and widely spaced examinations with the same appropriateness as in those which may adopt the semester system. Likewise, examinations can be completely or partially external with numerical marks as at present even though course units are shorter and examinations more frequent. Educational planning demands that all the variables in a particular situation should be taken into consideration and as much as feasible may be done. Between all or none several choices are possible.

This is the basis on which the Meerut University has proceeded.

## MEERUT UNIVERSITY

Semester system was introduced at graduate and post graduate levels with effect from July 1967.

The academic year has been divided into two semesters, the first extends from July Ist to December 7th, and the second from December 8th to April 30th. In each semester there are approx. 100 working days excluding the examination period. The Examinations come at the end of each semester, November 17-25 for the first semester, and April 21-30 for the second.

### Courses Offered:

General courses, supporting and supplementary in nature, and honours courses.

The general courses are intended for under-graduate students

The relevant ordinances and the titles of courses are given below:

1. Every candidate shall offer 4 general courses from a list of subjects, taking not more than two in each semester.
2. A candidate may offer in addition to the 4 general courses two additional general courses and in case a candidate secures pass mark, the fact will be indicated in the diploma. If the addition of marks obtained in the two additional general courses improves his division, the same shall be added to the marks secured in the required courses.
3. The course on religion and culture shall be compulsory for all students.
4. As a rule candidates shall not offer a general course closely related to any of his subject courses or those offered by him in intermediate or a qualifying examination except in the cases of Hindi and English. Those who had Hindi at Intermediate Level, can take literary Hindi and those who had English at Intermediate Level can take General English or English Literature at B.A. Level. A candidate may, however, offer one course only in a foreign or Indian (Regional other than Hindi) language provided it is the second course.

## HONOURS COURSES

The honours courses provided by the university, meet two tests. A student desirous of pursuing an honours course has to offer two additional courses from the list of courses prescribed for the purpose. In certain subjects, these courses may be from among the courses prescribed for Post-Graduate Examination, or they may be specially devised. In either case, they are not repetitive. The regulations for admission and for the award of the honours degree are as follows:

a) A candidate may apply for an honours course only after the I semester examination; admission will be made on the basis of his academic record.

b) The minimum requirement for the award of Honours Degree is 50% marks in the aggregate of the two additional courses, and a II class in the Degree courses.

c) The Division to be declared in the Honours course will be determined by the aggregate marks received in the regular courses provided that if the inclusion of marks received in the additional courses raise his position, they shall be counted.

d) However, in the case of a student who fails to secure an Honours degree because of third division marks in his regular courses, grace marks equivalent to 25% of the marks obtained in the aggregate of the Honours courses shall be added to the aggregate of the regular courses, to improve the division in the regular courses.

All the colleges are offering honours course in the subjects for which they are recognised. The distinction between honours and pass degree has become marked, and undergraduates are divided into honours and pass course students.

## EXAMINATION PATTERN

The university has 55 colleges scattered over five districts of the Meerut Division. Examinations are held at 34 centres. The answer books from these centres are brought to the university office in its own or a hired vehicle. The scripts, about 2,00,000 in number in each semester examination, have to be examined in about 12 days' time. The answer books are shuffled and repacked to be despatched to seven evaluation centres located in the midst of clusters of colleges. The Principal of the college is designated as the controller of the evaluation centre. In these centres the examiners assemble to examine the scripts during specified hours of the day under the overall direction of the Head and Deputy Head Examiners. The Head Examiner is mostly a senior teacher in the university who knows what standard has to be maintained. In order to set a common standard, the Deputy Head Examiner examines 10 answer books jointly with his co-examiners in accordance with the instructions of the Head Examiner. He is also required to re-evaluate at random at least five percent of the scripts examined by the examiners every day in addition to that of candidates who fail or fail to secure first division marks. Some of these functions are modified if he is also the sole Deputy Head Examiner when the number of scripts to be examined is small. Infact in a university with a large number of competing colleges, it is necessary to instil among students a feeling of security. They must have confidence that they will be judged fairly and impartially. To induce this, it has been made a rule in this university that no one shall examine his own students in a university examination as paper setter, or as script reader or for practicals. Even then there is an effort to guess with a view to influencing the judgement of the examiners. The movement of scripts is, therefore, kept secret up to the last moment. Examiners have no knowledge of centre from which they would be receiving scripts. The problem, however, becomes more complicated when the number of scripts to be examined is very small or when a course is taught only in one or two colleges. The practice of assigning fictitious roll numbers on reading by examiners has not proved very satisfactory.

Largely with a view to achieving the afore-said objective (confidence in the examination system) but also to lessening the element of subjectivity or even of carelessness, a provision has been made for the re-evaluation of scripts.

Early in 1965, a series of discussions were also held at Aligarh Muslim University reviewing the main shortcomings of the educational system. A large number of university teachers participated in these discussions. They were helped by members of the Education Commission and by other educationists in evolving a modified pattern of education such as would remove the main defects of the old system and satisfy the new aspirations of university education.

The teachers and the statutory bodies like the Departments, the Faculties and the Academic Council of Aligarh Muslim University considered the whole matter for nearly two years and decided, in 1967, that they should also adopt the semester system with a provision for honours courses in different subjects, together with many other improvements in the methods of teaching and in the system of examinations. It was felt that the introduction of the semester system alone could allow a flexible and dynamic approach to the subject matter just as it could facilitate reducing the negative impact of the examinations. A brief description of the semester system followed in this university is given below.

## ALIGARH MUSLIM UNIVERSITY

The university introduced Honours courses on the semester system at Undergraduate Level in the Faculties of Arts, Science, Commerce and Social Sciences with effect from the year 1967. The courses of study have been recast into semester courses. The semester system has also been introduced at the Post-Graduate Level.

## CREDIT:

Every semester course carries a number of credits. For example, a course extending over 3 or 4 hours per week carries 4 credits. A shorter course extending over 2 hours per week carries 2 credits. In order to earn the credits a student will have to pass in the sessional work prescribed for the course as well as the written examination held at the end of the semester.

A. The theory as well as practical examinations of 4 credits shall be of 75 marks and sessional of 25 marks. The same ratio will apply to other courses. The minimum pass marks in theory/practical examination shall be 1/3 of total marks.

B. No marks are awarded for sessional work in compulsory and general courses.

1. ATTENDANCE Examinations of a university other than the Doctorate examination shall be open to the following categories of candidates.

   a. regular students
   b. private candidates
   c. ex-students

2. A candidate shall be deemed to have undergone a regular course of study for the period specified for the course to be eligible to appear at the examination if he has fulfilled the requirements as given in the chart that follows:

| Faculty | Attendance |  |  |  | Sessional requirement minimum marks |
|---|---|---|---|---|---|
|  | Semester courses | Lectures | Practical work shop | Tutorial seminar |  |
| Arts | " | 75% | - | 75% | 33% |
| Social Science | " | 75% | 75% | 75% | 33% |
| Science | " | 75% | 75% | 75% | 33% |
| Commerce | " | 75% | - | 75% | 33% |
| Engineering B. Sc. & M. Sc. | " | 60% (combined) | - | - | 60% |
| Diploma | " | 60% (combined) | - | - | 50% |
| Law | " | 60% | - | 60% | 50% |
| Medicine |  |  |  |  |  |
| i) All P. G. Diplomas | " | 80% | 80% | - | - |
| ii) M. B. B. S. I & II (comb.) | " | 75% in practical Demonstration and/or final profession clinics in each subject. |  |  |  |
| iii) Other courses | " | 75% | 75% | - | - |
| Theology B. Th., & M. Th. | " | 75% | - | - | - |
| Arts | All non-semester courses | 75% | 75% | 75% | - |
| Social Science |  |  |  |  |  |
| Science |  |  |  |  |  |
| Commerce |  |  |  |  |  |

Provided that the Academic Council may, in special circumstances, condone any shortage in such attendance.

Provided that the Academic Council may, in special circumstances, condone any shortage in such attendance.

## EXAMINATIONS:

i) The written examination in compulsory subjects other than English, shall comprise one paper of two hours' duration in each course. Regular students may also be permitted to appear in the compulsory and general courses (other than English) along with private candidates.

ii) The written examination in compulsory English, subsidiary and main subjects shall comprise one two hour paper per course to be held at the end of each semester.

iii) Private candidates shall take the same examination in compulsory English, subsidiary and main subjects as the regular students. The examination of compulsory courses other than English for such candidates shall be held separately in April/May every year and shall comprise one two hour paper in each course.

## SEMESTER COURSES

The semester being of about 16 weeks duration, each semester course would be based on about 40 lectures and tutorials. The shortest course would be based on about 25 lectures delivered during a semester. The courses were intended to be centered on certain major topics or areas. Number of credits, grade for a pass course which a candidate should pass in order to be eligible for the award of B.A. and B. Sc. Pass and Hons., B.Com. Pass and Hons. are given below:

## UNDERGRADUATE

### B.A. (Hons.) and B. Sc. (Hons.)

In order to be eligible for the award of B.A. (Hons.) or B. Sc. (Hons.) degree a candidate shall have to pass in sessional work and semester examinations so as to accumulate at least 120 credits in the following manner.

a) Compulsory and general courses 24 credits as follows:

| | | |
|---|---|---|
| 1. | English | 12 |
| 2. | Urdu or Hindi or any other Modern Indian language or Indian History and Culture. (last mentioned subject for foreign students) | 4 |
| 3. | Muslim Theology or Ethics or History of Science or History of Civilisation | 4 |
| 4. | General courses as prescribed by the Academic Council from time to time | 4 |

Provided that candidates who take English as the main subject may be allowed by the Head of the Department of English to take a Modern European language in place of all or part credits of compulsory English.

Provided further that in the category (2) alone a candidate shall not be allowed to take the same language which he has studied upto an advanced level for the High school or Higher Secondary Examination.

a) main subject - 48 credits

b) subsidiary subjects - 48 credits

Provided that at least two subsidiary subjects shall be taken by each candidate with not less than 16 credits in each subject.

## NUMERICAL AVERAGE GRADE

The division in which successful candidates are to be placed shall be determined on the basis of the Numerical Average Grade obtained by them in sessional work, and in examination in compulsory English subsidiary courses, and main courses. Candidates who accumulate not less than 120 credits and who obtain a Numerical Average Grade (NAG) of not exceeding 2 shall be placed in the First Division; those who similarly obtain an NAG of not exceeding 3 shall be placed in the II division. The Numerical Average Grade will be the average of the grade of all courses in which a candidate has passed, using the following numerical values.

| | Grade | Numerical Values |
|---|---|---|
| Outstanding | A* | One |
| Very Good | A | Two |
| Good | B | Three |
| Satisfactory | C | Four |
| Unsatisfactory | D | Five |

Candidates who accumulate 120 credits as specified but who obtain an NAG exceeding 3 but not exceeding 4 shall be awarded a B.A. or B. Sc. pass Degree.

B. Com (Hons.)

In order to be eligible for the award of B. Com (Hons.) degree, a candidate shall have to pass in sessional work and semester examinations so as to accumulate at least 128 credits in the following manner.

| | | |
|---|---|---|
| a. | Compulsory General Course | 24 credits - same as given for B.A. (Hons. and B. Sc. (Hons.) |
| b.) | Commerce Course | 104 credits |

The main subsidiary compulsory and General Courses shall be taken by a regular or private candidate in accordance with the decisions of the Faculty of Commerce and with the approval of the Advisor appointed by the Department of Commerce.

The courses, the number of credits and marks, allotted to each course including sessional work and/or Practical examination and/or viva voce examination shall be prescribed by the Academic Council on the recommendation of the Department and Faculty of Commerce.

To pass in a course and obtain the credits assigned to it, a candidate must obtain at least Grade 'C' in sessional work (if prescribed) and at least Grade 'C' in the written and/or practical and/or viva voce examination.

Only during the last five or six years, many universities have started taking a lot of interest in the semester system through the schemes designed for the setting up of the Examination Reforms Units/Cells.

This is because of the fact that fifteen universities* were selected by the UGC for introducing the much needed reforms in the system of examinations at all levels. So, the UGC appointed one more committee of experts for this purpose. The committee produced a document called "Examination Reform - A Plan of Action" and it contained" the introduction of semester system as one of the measures.

First of all, Gauhati and Baroda Universities started a separate unit called the "Examination Reform Unit". Then in 1974, an Examination Reform Cell was set up in Mysore University. The other universities also initiated action in this direction. The UGC made a generous financial aid of Rs. 5 lakhs to the selected universities for this purpose during the fifth plan period. As per this programme universities like Calicut, Madras, and Mysore conducted a number of workshops in different fields.

The need for reform at Calicut university was realised acutely at the seminar of Post-graduate teachers held in August 1970 to discuss ways and means of raising the standards of teaching at the post-graduate level. The teachers then suggested that any reform being contemplated to improve teaching though desirable would not bring about expected results unless our present outmoded system of examination - testing only the memorised knowledge of the students - was replaced by a better, more dynamic evaluatory system. When this is done, it was felt, there would be changes in the methods of teaching-learning and the unity of function of teaching, learning and testing brought about more clearly. Following up the recommendations of this teachers' seminar, the university decided to initiate a programme of Examination Reform with suitable assistance of experts like Dr. Walker H. Hill, Dr. Harper, Prof. Frankland, Prof. Natarajan, Dr. Misra and others. An organizing committee consisting of members was constituted by the Vice-Chancellor on July 26, 1971 to formulate the plans and conduct the various workshops and seminars.

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* Aligarh Muslim University, Andhra University, Burdwan University, Calcutta University, Calicut University, Gauhati University, Jadavpur University, University of Jammu, M.S. University of Baroda, University of Mysore, Punjab University, University of Poona, University of Rajasthan, Saugar University and Saurashtra University.

Accordingly, the first major activity was to have an Orientation Seminar the object of which was to prepare the ground for a favourable reception of reform measures. It was decided to have teachers and students representing every college at this seminar. Nearly 400 teachers and 90 students participated in these. The Orientation Seminar created the necessary receptiveness and provided for the right kind of attitude which was largely responsible for the successful and smooth functioning of workshops conducted later.

The second, perhaps the most crucial activity, was the Primary Workshops for which the participants were selected from those who attended the Orientation Seminar. A total of 226 teachers representing 30 subject areas received training in

a) Defining educational (instructional) objectives in their subjects at different levels.

b) techniques and principles of evaluation

c) designing question papers to suit the objectives listed in (a).

In addition, they discussed at length matters like frequency of examinations, organisational changes necessary to put these changes in to practice and internal assessment etc. A very important aspect of this is that question papers were designed in every subject at all the three levels of predegree, degree and post-graduate.

From each subject group in the primary workshops a number of participants were selected to serve as group leaders in the secondary workshops. These were selected on the basis of the readiness of response to proposed reforms and eagerness to work. A training programme for three days for these group leaders was held to outline their role in subsequent secondary workshops.

The secondary workshops were meant to involve the maximum number of teachers possible. These were conducted at four zonal centres and principals of well established colleges at these centres helped to organise. The teachers were drawn from all colleges and they belonged to different subject areas. They also dealt with predegree, degree and post-graduate classes in their colleges. The Heads of Departments of each college in the Zone were invariably required to attend. In all a total of 751 teachers participated in the Secondary Workshops, which in their programme of work were similar to those of the Primary Workshops.

The meeting of the student representatives discussed the recommendations of the workshops. There were 50 students in all including president of the University union and leaders of student opinion from the various colleges. This was particularly useful because it prepared students for the new change and helped in getting their acceptance.

Each subject group was encouraged to make recommendations on the topics listed here:

1. Paper setters
2. Examiners
3. Frequency of examination
4. Types of questions to be used
5. Optional questions
6. Preparations of teachers and students for change in examinations
7. Turning (if a new kind of question paper should be adopted, when should it be effective).
8. Practical examinations
9. Scaling of marks
10. Grading
11. Examination Unit (or cell)
12. Internal assessment etc.

Among the many recommendations of the subject groups, the main areas are:

1. Introduction of annual university examinations
2. Reforming the design of question papers with a view to providing diversified types of questions such as essay, short answer and objective types so that much more of the syllabus can be covered than is possible under the existing pattern of question papers.
3. Establishing an examination unit at the university with suitable qualified people to carry forward the reforms.

These were put before the academic bodies for approval. An examination unit as part of the new University Department of Education was established. Examinations and other kinds of evaluation are too important to be trusted to amateurs. Their work must be supplemented by that of a professional staff - a staff of examination experts, specialists in evaluation. The work of the Controller of Examinations is administrative whereas that of the Examinations Unit is professional. The Examination Unit does not duplicate the work of the Controller but complements it. It must work in consultation with Boards of Studies and with teachers in the University and the colleges. The Examination Unit now is

a) responsible for the final form and content of each question paper.
b) inviting questions from all teachers in colleges and the university departments.
c) refining these questions and developing a large collection of acceptable questions in each subject.

A few Question Bank projects were initiated in sciences, both Physical & social, humanities, languages etc. and a series of workshops conducted to produce a large number of questions with an already accepted blue print and table of specifications. Most of these Question Bank projects were initiated.

d) taking care to see that the stock of questions is constantly growing and improving in quality. A check list of criteria to prevalidate questions/ items (all types including multiple choice and other objective type, short answer, long answer etc.) was developed and put to use.

e) helping paper setters to set question papers from the card.

f) taking care to see that each question paper is set according to design previously approved by the Board of Studies.

g. getting the external examiners (paper setters) to come to the university to make judgment on the final quality of question papers.

h) setting up question papers for M.A./M.Sc. examinations for university's own departments.

i) supervising the work of examiners, organizing valuation by examiners under guidance.

j) researching into examinations in the areas of types of questions, item analysis, retention of questions in the parts, provision of analysed results to colleges.

k) helping to design internal assessment.

The reform continues and attempts are made to devise rational procedures for storage of cards of question/item and further work is planned in the areas of Question Bank, internal assessment and grading.

This particular model is worth adoption by the universities (atleast those that are selected initially to put the reforms into practice) with modifications to suit their own systems. It is worthwhile to take the experiences of such universities (Calicut, Gauhati, Meerut, Allahabad etc.) before implementing the reforms in all universities.

The results of the university examinations in different courses do not easily lend themselves to simple interpretation. The Report on University Examinations (1966-74) brought out by the Mysore University (with over 130 colleges and 3 postgraduate centres) is perhaps the only one of its kind which points to an aggregate of factors influencing examination results.

Now that the introduction of the semester system through the setting up of Examination Reform Units has become popular and 80 out of 126 universities, including Agricultural Universities, deemed universities and other Institutions of National Importance have already adopted it[1]. All these universities have expressed themselves in favour of this system of education and have or are implementing it with different degrees of success, both at the undergraduate and post-graduate levels. Below are given details of the recommendation made regarding the semester system in the seminars and workshops conducted by the Madras University.

The University of Madras, under the leadership of its Vice-Chancellor, Dr. Malcolm S. Adiseshiah, has undertaken an overall reform programme in teaching, learning and evaluation involving: (a) revision of the curricula (b) semesterised learning (c) restructuring of question papers and (d) grading. While the University has been updating the curricula frequently as advised by the various Boards of Studies in consultation with the affiliated colleges, curriculum revision has received a new tempo, taking note of the several changes being brought about by the Vice-Chancellor, to gear higher education to national needs and development. The curricula so developed for the various subjects and major areas have been passed by the Academic Council at its meeting held on March 5, 1976. Forty colleges have come forward at the invitation of the Vice-Chancellor to introduce the Semester Pattern in the undergraduate classes. The Semester Pattern has been introduced in all the post-graduate courses from 1976-1977. Simultaneously, the restructuring of question papers has also been undertaken by the various Boards of Studies. Thus all the aspects of the teaching-learning situation are being covered in a package programme.

The semesterised pattern of learning is gradually spreading to all universities. Though there are some variations in the actual working of the system between the universities, the objectives and goals of the system are the same in all cases.

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[1] Information regarding the semester system followed in various universities has been given in the Appendix.

# SECTION THREE

## A SYSTEMS APPROACH TO DESIGN OF SEMESTER SYSTEM

# A SYSTEMS APPROACH TO THE DESIGN OF SEMESTER SYSTEM

In the past,few universities and other institutions in the country introduced 'Semester System' for their courses in place of the usual, traditional 'annual' systems. Very often, the design of such semester systems was ad hoc and arbitrary and occasionally based on 'foreign models' implanted into ours. The basic and fundamental principles were not understood and taken into account and clear cut, specific goals and objectives were not set forth. Quite expectedly constraints and restraints were not also considered with the result the implementation was not successful and atleast it did not yield the results that they thought it would. The idea behind this section is that this should provide enough information regarding designing of a new system which will take all the above mentioned weaknesses into account.

One of the basic reasons why the 'Semester System' has failed is that the system has not been designed with a scientific 'systems approach', a technique that gives much promise when applied to education and by which means a thorough analysis of a system or subsystem may be undertaken. It is vitally important that educational systems become more dynamic and adapt themselves more quickly to the needs of the society.

'Systems approach' is a generic term that covers a body of theory and practice of which 'systems analysis' forms a part. 'System thinking' is however very basic and this has led to developments in many areas of human endeavour. It is therefore necessary here to present these three and try to design a new pattern of semester system through the 'systems approach'. The need of 'systems thinking', 'systems analysis' and systems approach' in a system of education is dealt with, at first, to solve problems in the areas of Teaching/Learning/Testing which are the important components of the semester system. It emphasizes the fact that alternative solutions proposed on the basis of 'systems approach' to such problems will have to be examined and a particular chosen alternative is implemented, evaluated and utilised to provide better alternatives in future. It describes clearly the basic concepts, presents the detailed design of procedures for designing semester system, gives examples and finally suggests ways and means of checking the extent to which the objectives set forth have been achieved. It also makes it possible to find ways of overcoming what appear to be overwhelming constraints by considering the problem in a logical way. To do this requires knowledge about how to organise one's thoughts and record them in a manner which allows a complete view of the components of the existing system. Components may then be examined in terms of the contributions they make (or can make) and the way in which they relate to each other and to other systems. A series of questions can be formulated within the frame work of 'Systems thinking' and these questions can be examined in general terms and then applied to real situations to provide a design of a 'semester system'.

## QUESTIONS TO PROMOTE "SYSTEMS THINKING"

It is assumed here that there is dissatisfaction with some aspect of an existing situation (system) i. e. the annual traditional education system.

a. What signs in the existing system are causing dissatisfaction?

b. What are the reasons for these unsatisfactory signs?

c. What must be done to improve the situation?

d. What criteria of success are acceptable?

e. How is success to be measured?

f. What ways exist of realizing the general aims?

g. How is the best way to be selected?

h. What components must be supplemented, modified or replaced to achieve the best way?

i. What characteristics in the existing system must be accomodated in the design?

j. Have characteristics been specified that must be included?

k. How is the new system to be constructed?

l. How can the efficiency achieved be maintained in the face of changing circumstances?

m. How can the amended/new system be introduced and made to work?

## SYSTEMS ANALYSIS

Before one looks at 'systems analysis', it is necessary to define what we mean and understand by a "system". The term system has been defined in many different ways by several writers - one definition that is more comprehensive is that by Ackoff (1960) who defines it as 'A system in an entity (conceptual or physical)that consists of independent but inter-related parts'. While 'systems thinking' involves thinking in a comprehensive, perspective way about the system, 'systems analysis' refers to applying a set of procedures which enable an analysis of the existing system to be undertaken.

Systems analysis may be defined as methods of making practical use of the views of the nature of the world. In general, these methods seek to define the relationships existing in a system (and between it and other systems) and to calculate the effects of altering either the elements of the system or the ways in which they interact. That 'Systems analysis' permits the use of common logic and vocabulary across organizational and disciplinary lines is no small part of its usefulness in the practice of management in situations where inter-disciplinary and inter-sectoral collaboration in development and problem solving is needed.

A more complete picture of systems analysis of instructional systems is given by Coombs (1968) - he lists 12 major components of the system. They are:

1. Aims and priorities
2. Students
3. Management
4. Structure and time schedule
5. Content (subject matter)
6. Teachers

7. Learning aids
8. Physical facilities (for housing the process)
9. Technology
10. Quality control
11. Research and
12. Costs

Summing up, 'systems analysis' is what results in analysing the existing system, namely identifying its components, their functions, their interrelationships, interactions within and outside and also additional components, their needs,their relationships etc. Systems analysis is to be done before 'systems approach' consisting of a set of procedures to solve problems of education and training.

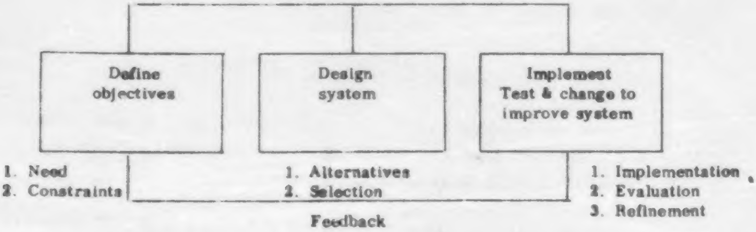
## SYSTEMS APPROACH

'Systems approach' is a logical, scientific and step by step method of solving educational and training problems. Solutions to educational and training problems with systems approach are likely to be superior in that every aspect of the problem is studied in depth and proper and suitable safeguards are provided. Several alternative solutions are generated and this is in keeping with the nature of open ended problem-solving more so in the fields of education and training. Put simply, the systems approach could be said to consist of eight steps.

1. Define the Need - the education or training problem.
2. State the Objectives - the learning goals that can be measured.
3. State the Constraints - the restrictions or limitations on the course development.
4. Define the Alternatives - that is the different ways in which the learning goals may be reached.
5. Make a Selection - choose the best alternative
6. Carry out an Implementation procedure, that is to run a pilot operation for the type of course you have decided to try.'

7. Institute an Evaluation procedure, that is measure the results actually obtained and compare them with the objectives originally set out.
8. Refine the oourse - change the system in the light of item 7 and carry out step 6 again until a satisfactory result is obtained.

In this section, systems approach has been used to design semester system.


Define objectives
Design system
Implement Test & change to improve system
1. Need
2. Constraints
1. Alternatives
2. Selection
1. Implementation
2. Evaluation
3. Refinement
Feedback

Simple systems model

All the eight steps outlined earlier are gone through in respect of design of semester system as under:

I. The first step in systems design is to identify the NEED. The NEED was felt by college teachers of different universities who were dissatisfied with the present system of semester ; (if already introduced) the course did not fulfil the purpose viz. students at the completion of the course were unable to perform well in job situations in trade, commerce, business and industry and higher continuing education courses; lack of specificity, clarity of the present syllabus.

- intellectual abilities and skills to be developed for successful job performance are not specified.
- no balance of theory with practice.

- some subjects studied are irrelevant.

- the course does not produce confidence in students.

The present 'annual' system allows students to concentrate on studies only at the end and encourages cramming and selective reading.

Both the kind of teaching and the nature of examinations at the end, do call only for the skill of storing information & giving it out from memory. Many important intellectual abilities like comprehension, application, analysis, synthesis, evaluation are not being developed and they are also not tested.

## II State the GOALS AND OBJECTIVES

As soon as we think of goals and objectives we come face to face with the fact that the existing system (annual traditional system) operates with only half the goals defined.

The three elements that are easily identified in the existing education system are (i) syllabus (ii) teaching performance of the teachers, learning attainment of students, facilities and (iii) evaluation.

In fact, the syllabus as it obtains now is extremely inadequate. It does not specify even the content areas fully and clearly. So, for a new system like semester system, the document syllabus should be more carefully and scientifically prepared to specify clearly.

a. all subject matter to be taught
b. activities of students
c. link with other subjects
d. breadth and depth of treatment
e. industrial, live and practical examples of applications of subject matter
f. student's abilities to be developed
g. student's information and skills to be developed
h. teacher's method of teaching
i. teaching/learning aids
j. time allocation

k. class room organisation, lesson planning, evaluation
l. type, frequency of tests

Once this is done the syllabus becomes 'dynamic', and in the preparation of semester syllabus in any one subject a lot of scientific, psychological and educational thinking is a must.

As regards the teaching performance of the teachers, they should not teach to cover the syllabus alone. Their teaching should be more to 'uncover' the syllabus so that students will 'discover' the subject content. The traditional method, i.e. lecturing must be given secondary importance and greater number of hours have to be allotted for assignment, tutorials, discussion and project, laboratory work, home study because higher order intellectual abilities and affective abilities are all developed only by these methods. In terms of the learning attainment of students, the methodology of teaching must lay a lot of emphasis on effective learning characterized by achievement of specific objectives.

In terms of evaluation, better and affective methods of student performance during and at the end of the semester are to be adopted. Internal continuous assessment for abilities and skills that are not tested by end semester examinations must be given proper weightage and there should be increasing objectivity in the tools of evaluation.

III State the CONSTRAINTS - Some of these are

a. the time available for transferring a given input to the desired output

b. the ability, background of students at input stage.

c. the existing system

d. the attitude and support of administration and faculty.

e. the lack of pedagogical and professional training of faculty.

f. availability of physical facilities.

g. limitations on financial inputs.

h. the nature of examinations.

IV Define the ALTERNATIVES

It is now possible with a detailed specification of output (goals and objectives). There can be many alternatives to this at least in respect of weightages and emphasis given. All the possible alternatives are considered.

V Make a SELECTION

After quite a lot of discussion with faculty, administrators and others one particular solution is adopted. The selected solution to the problem is given in the section five, design of semester system.

VI IMPLEMENT

This can be under implementation from the year 19.....

VII Institute an EVALUATION

Procedure; obtain feedback information.

VIII REFINE the Course

On the basis of feedback information and carry on from step VI. B) Scientific design of a 'semester system' for Undergraduate and Post-graduate courses has been completed and given away to universities for implementation.

Conclusion: Thus certain signposts of dissatisfaction in the traditional system or in the existing semester system which is not satisfactory can be studied and a Need can be established for improving the existing system or designing a new system. Certain Constraints that prevent such improvement or new design can also be listed with the idea that in implementation these can be taken into account. The Goals and objectives of the improved system or new system are clearly spelt out and it will then be possible to suggest Alternatives that are all equally feasible. The systems design has this advantage that it is able to generate alternative solutions and it will then be necessary to select one alternative for trial implementation. This is implemented and evaluated and the feedback information used to modify and improve the design of the system.

This then, is the systems approach, a logical scientific approach to design semester system. In this systems approach, a thorough analysis of a system has been undertaken. In the ultimate analysis, the success of this approach will depend on the ability of educators and teachers to define the system goals and to apply the precise description of short term objectives at every stage. The potential gains in student motivation, learning and ability are considerable and would make the effort in applying the 'systems approach' well worthwhile.

## SECTION FOUR

## GOALS AND OBJECTIVES OF SEMESTER SYSTEM

## GOALS AND OBJECTIVES OF THE SEMESTER SYSTEM

Most of the problems that have to be faced in developing a course of learning are familiar to university teachers, because they arise from our effort to prepare a course for students. But they are rarely considered systematically and their implications are often overlooked.

The 'clarification of objectives' is not a phrase that will be very familiar to teachers in higher education and many may be tempted to dismiss it as meaningless pedagese. Yet it describes a process for making explicit a problem which is normally implicit: the problem of deciding what to teach. It has been traditional to list topics in the form of a syllabus, to make general declarations of intent such as ' we try to teach our students to think' or 'we want our students to be good engineers", and to leave the rest to the individual teacher. The teacher then has to decide how much of a topic to include and to what level to take it; and at the same time somehow to relate his decision to his 'inspirational' aims of teaching his students 'to think', 'developing good engineers', etc.

One of the strongest arguments for giving greater attention to objectives has come from those concerned with problems of assessment. There is now an increasing desire in higher education to design more valid instruments of assessment which attempt to measure what the teacher wishes to teach, but this can only be done when the teacher has specified his objectives. Psychologists studying teaching and learning have also found a need for clearer statements of objectives, since it is becoming apparent that some methods of teaching and learning are better for some objectives, and other methods are better for other objectives. Then there is the further problem of communication. Even though a senior professor's closest colleague may know exactly what he is teaching when he lectures on a given topic his junior colleagues may be less certain, and his students will sometimes have very little idea of what is coming. It is difficult for them to focus their attention if they do not know what is to be learnt and the syllabus often gives them little guidance. Thus the problem of evaluation, the problem of selection of teaching methods and the problem of communication are all dependent upon the clarification of objectives.

There is as yet no common language in which teachers can communicate with one another about objectives with any degree of precision. Though teachers are prepared to discuss their aims in general terms and indicate what they are trying to teach, it is rare to find the objectives of any course stated clearly - certainly not with sufficient clarity for it to be possible to judge the success of the teaching by comparing its outcomes with original objectives. While this is partly due to the professional status of teachers in higher education, which makes it difficult to challenge either the aims or the effectiveness of a teacher, it is also due to the difficulty of the task of describing objectives with adequate precision. A further difficulty arises from the fact that the curriculum is based primarily upon the traditional system.

This system is an "Open Loop" system - an ineffective and inefficient one.

In present day teaching in colleges, there is concern for the subject matter to be learnt and this is specified in a detailed way in each course syllabus, (if not, the teacher's first job is to expand the syllabus, and arrange it into units of lessons in a sequence). It is a pity that the specific intellectual operations the students are expected to perform are not specified in a detailed way. What are the intellectual modes to be developed and what are the intellectual operations to be performed by students? The most important modes are analysis, synthesis and evaluation, and the most important operations are recall, manipulation, translation, interpretation, prediction and selection. For any one to be successful in his profession, he needs to have all these modes and the ability to perform these operations. The present system, due to lack of specification of intellectual modes and operations, lays emphasis only on directed single answer problem-solving situation, analysis function and recall and manipulation abilities. There is one other reason for this sort of emphasis- the fact that directed single answer problem-solving situation, analysis function, recall and manipulation are too easy to teach and test. In majority of jobs undertaken by graduates of Science, Technology, Humanities & Commerce at the end of their courses it is absolutely essential that they know how to attack and solve open ended problems, using the three major functions of analysis, synthesis and evaluation and capable of operating all the six intellectual operations. Any course, therefore, must:

a. help the student to learn to use the six abilities while solving single answer problems that involve the significant concepts and principles he should know

b. help the students to learn to solve open-ended problems to think for himself logically, and sequentially, to gather information and communicate and use analysis, synthesis and evaluation

c. provide a chance to the student to play the role of a professional

d. provide an opportunity to the student to have values.

If these four goals are accepted by teachers, then one teaching method, that of lecturing, is highly inadequate to achieve these goals. There ought to be a combination of methods designed to achieve these goals. The teacher must think in terms of giving a lesson and not a lecture. A lesson is a closed loop method.

## CLOSED LOOP SYSTEM

Plans for Lecture and Lesson

a). Plan for Lecture: this shall include details like introduction to topic development of topic, consolidation of topic and summary.

b). Plan for Lessons: this is to be very scientifically prepared by

1. analysing individual lessons in terms of not only the content but the abilities to be developed. The teacher must now try to spell out educational outcomes in behavioural terms, viz. what the student will be able to do at the end of a lesson that he

was unable to do at the beginning. There are many sources of information*

2. a clear understanding of how students learn, methods of effecient learning and retention, behaviours of individuals and groups, etc.

3. grouping these objectives in terms of teacher activities and student activities (incidentally, the teacher will discover that there are more student activities than teacher activities)and preparing a schedule of activities in a logical sequence to achieve these objectives.

4. a sound knowledge of communication channels available to choose from such as:

i) Lecturing (live or recorded T. V., film or audiotape)
ii) Discussing (teacher and/or students and/or experts)
iii) Demonstrating or experimenting (following directions or discovering)
iv) Audio-visual aids (pictures, charts, over-head projector transparencies, film strips, films, models tapes)
v) Testing (formative and/or summative)
vi) Single answer problem solving (text book problems)
vii) Open-ended problems (design problems)
viii) Reading (text-book, programmed instruction literature)
ix) Writing (reports, notes)

Of these, lecturing is suited for purposes of motivation, inadequate for content transmission and practice of intellectual abilities

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* i) A Taxonomy of Educational Objectives, Vol. I, Cognitive Domain: Bloom etal; Vol. II, Affective Domain by Krathwol; Vol, III, Psychomotor Domain. by Elizabeth.

ii) Preparing Instructional Objectives by Robert Mager, and

iii) Stating behavioural objectives for the Class room teacher by Gronlund.

iv) Natarajan. V, Learning outcomes. Checklist p. 13-20 Monograph on Internal Assessment for Univs. AIU, 1977.

| | |
|---|---|
| Discussing | suited for developing the six intellectual abilities and three modes of analysis, synthesis and evaluation. |
| Demonstrating or Experimenting | Very effective in learning basic concepts, principles and application; there is high retention and transfer; helps to co-ordinate theory with practice. |
| Audio-visual Aids | effective form of communication; there is high retention and possible transfer; suitable for information transmission. |
| Testing | formative for diagnosis and remedy; summative for achievement. |
| Single Answer Problem Solving | suitable for practice of intellectual abilities of recall, manipulation, translation, interpretation predicting and selection. |
| Open ended Problem Solving | suitable for developing modes of analysis, synthesis and evaluation; professional relevance and validity can be built in. Students can be encouraged to work in teams, much the same situation obtaining in their professions |
| Reading | Programmed instruction materials enable students to acquire subject matter at their own pace and to practice the six intellectual operations. This is the method to individualise instruction and this can be done out of class time so that class time |

| | |
|---|---|
| | can be devoted for discussion, solving open-ended problems etc., involving analysis synthesis and evaluation. |
| Writing | Suitable for reporting skills. |

5. a sound knowledge of psychological principles of learning, namely

a. Organise the subject matter:

identify specific concepts and principles, Arrange in a sequence (simple to complex), Provide verbal visual organisers and analogies.

b. Organise intellectual modes and abilities.

Identify specific modes and abilities, integrate them with the content

c. Organise student activities:

Guide him - demonstrate or ask to experiment, supervise trails, give necessary reinforcement

Provide for practice: give examples, grade them

d. Evaluate - Feedback reinforce correct responses correct inadequate responses

Formative to find that the student is ready to move on

Summative to find whether the student has mastered the stated objectives.

e. Motivate, encourage

show values of learning concepts and principles in relevance to meaningful work

f. Individualise.

The plans for lecture and lesson in a closed loop system are all applicable to what is called the semester system. There are about fourteen objectives which can be achieved by the implementation of the semester system. They are listed and described below:

a. The quantities of content in various subjects would be proportioned suitably into semesters.

> This means that the content areas for the earlier semester have to be of lower order involving information; and complex areas may be included for the later semesters. Similarly, the preliminary areas must deal with the simpler abilities, like comprehension and knowledge while the later ones must deal. with more complicated intellectual abilities like application, analysis, synthesis and evaluation. By and large, there must be a built-in continuity in respect of both content and abilities.

b This helps students to achieve their objectives in a better way. This means that the above mentioned continuity in respect of both content and ability will help the students to achieve the objectives, which they have for the semester system of learning, in a better way.

c. There is greater freedom to change subjects and the combinations even in the middle of the course. This means that under the semester system, there is a provision for changing the subjects and combinations like ancillaries even in the middle of the course by means of the "credit course system". The credit system is basically a system for simplifying what has been called "academic book keeping." A student earns his diploma by accumulating a specified number of academic credits instead of attending for a specified number of years. A university usually prescribes that a certain minimum number of credits must be obtained in the student's main department. The distribution of the remaining credits may be unrestricted, or it may be restricted in accordance with any scheme which the university may desire. It is thus evident that the credit system has the effect of adding considerably to the flexibility in changing the subjects and combinations in the middle of the course by the semester organization of the academic schedule.

d. There is flexibility to choose the number of courses in every semester between two and seven

This means the same thing as is meant for the third objective, and 'every semester between two and seven' means the II semester for the 6 semester degree courses and up to the VII semester for the 10 semester degree courses. This is because from the VII semester i.e. from fourth year, students will choose their branches of specialisation and hence it is not possible to change their courses after the VI semester.

e. Continuous assessment being an important component of the semester system encourages the students to work systematically throughout the course.

This means that continuous assessment is a way of redressing the balance carried out by the student's own teacher, who is in a unique position to see the student as a whole person, as well as to help analytically with the assessment of his progress. For the sake of validity, it may be argued that the process of assessing a student's progress should be continuous. In this sense, written tests, oral questioning and discussions, projects reports, classwork, home work, etc., are all considered to be assessment measures. Therefore, records have to be kept. In one sense, it means gaining more and better information about the student and using this as the course develops. It also represents the continuous awareness by the teacher of the development and knowledge of his students; it is a process which extends over a period of time; the gradual build-up of a cumulative judgement about performance.

f. There is increased self-reliance on the part of students in respect of schedule, evaluation and performance improvement. The main purpose of introducing continuous assessment is to integrate teaching and evaluation and to test those skills and abilities which cannot be tested through a written examination at the end of a course. For this, teachers must identify the abilities/skills they want to develop in their students in their own subject areas and then allocate weightage to the selected abilities/skills. They are also to make a choice of method, design the schemes, taking into consideration the possible constraints of time, effort, finance and acceptability. The marks or grades obtained by students are made known to them immediately after evaluation is completed. Added to this, work done in every tutorial, assignment, project etc. is returned and results discussed with students individually.

g. Shortage of attendance in a subject is no bar to the student taking examinations in other subjects where attendance required is fulfilled.

This means that by the introduction of the credit system of teaching. each course unit (subject) is a separate one and is not linked with any other subject and if a student possesses the necessary attendance for a particular course unit, he can appear for that paper alone and he will not be detained for not obtaining the required number of credits in other subjects.

h. Continuous internal assessment with more emphasis on abilities that are not tested by a semester examination forms an integral part of the system. This means that assessment is done in relation to certain abilities and skills in certain subject areas periodically and continuously. This has to be planned at the time of curriculum development, syllabus interpretation and clarification of the objectives of learning. This is internal in the sense that the teacher of the subject in the institute is to assess and no external agency comes in.

It is therefore necessary to keep internal assessment and external semester examination marks/grades separate. This means that in as much as internal assessment is for abilities/skills that are not tested by end university examination, it is meaningless to add the two. At the same time, there can be no doubt that unless students see the importance of internal assessment in their final mark or grade, the motivation and interest for internal assessment will be lacking if not absent. If, however, the grading system is adopted, internal and external have to be shown separately.

j. Students have the opportunity to discuss their answers in all accepted tools of internal evaluation. This adds to reliability.

This means that the teacher while returning the scripts of the mid semester end semester examination explains the scheme of evaluation. The students are given sufficient time to go through the scripts and bring to the notice of the concerned teacher the discrepancies, if any, in marking. The marks obtained by the students are also put on the notice board so as to enable the students to know where they stand with respect to others in the class. The student is given an opportunity to appeal to the departmental Academic Committee consisting of the Head of the Department and two or three senior members of the Department, if the student is not satisfied with the marks awarded to him by the teacher. Further he may even appeal to the college Academic Committee if the matter cannot be settled with the teacher and the Departmental Academic Committee.

k. One of the components of Internal Assessment, namely periodical tests, prepares students continuously for the final examination thereby eliminating the fear of the unknown. This is self-explanatory and it needs no description.

l. The semester system does include improved methods of assessing student performance in semester examination, making increased use of objective type testing.

This means that in the semester system of assessment we have a list of methods that can be employed to evaluate the abilities. Some of them are (i) Short duration objective type tests. (ii) Short answer essay/problem solving and (iii) Long answer essay tests. Out of these three important methods of assessment, it has been proved after intensive research and analysis that the objective type of testing should be given more weightage than the other two namely short answer and long answer. For example, in a semester system of question paper, the number of objective type test items should be - 15 to 40 and number of short answer and long answer should be 8 to 20 and 1 to 3 respectively. With this pattern of question paper, it is possible to cover a wide range of syllabus rather than by asking questions from a specified portion or chapter.

m. A question bank, if made available will help in the effective implementation of semester system.

This means the importance of Question Banking in the functioning of the semester system. This is because a question bank allows careful pretesting of questions from which advance information could be made available to examination boards; such information being of a statistical nature, some times accompanied by a description of the learning objective that the question was designed to measure. This description helps to decide retention, improvement or rejection of questions. The data would complement the judgement of examiners and teacher and not in any way supplant their necessary freedom to select their own questions. The practice of pretesting questions with representative samples would mean that the teacher could compare the performances of his own students with those of the wider population, thus contributing to the overall maintenance of national standards. A carefully built up question bank can influence curriculum development. In building up a bank of questions some reappraisal of what these questions were intended to reveal in terms of pupil learning might become necessary. A question bank could be composed, at least, of questions produced to fit this specification of objectives. Each question would be related to a particular objective of learning and would therefore play a small but vital part in measuring the total achievements of the individual. The potential advantages are thus obvious. A question bank offers the chance (a) to produce and evaluate questions on a relatively more effective basis; (b) to carry out concurrent comparability. (c) to match the examinations to the curriculum that is taught and not as tends to happen in the conventional setting the other way round. The question bank would act as a neutral educational and administrative service helping teachers and examiners to solve some of the problems with large-scale examining.

In a semester system, there is increased rapport and relationship between teachers and students. This means that because of the internal assessment system in the semester system of evaluation, students cannot misbehave or criticise the teachers and that there is a friendly relationship between them.

Clearly the appropriateness of any given educational system will depend on one's aims and priorities, and many people may not prefer to follow any of them. Our purpose in discussing them has been as much to illustrate the difficulties of formulating objectives as it has been to recommend specified procedures, though we have ourselves found it useful to adopt such system. It is our conviction that even when such systems are ultimately rejected, the effort to adopt them leads to a deeper understanding of the problems involved.

This brings us back to the question with which this chapter began. Why are objectives important? There are three main arguments: (a) objectives aid communication; (b) objectives aid a rational and efficient selection of teaching and learning activities and (c) objectives are essential for evaluation. Let us examine each argument in turn.

Explicit objectives may improve communication between teacher and student, between students and between teachers. The student usually gets three conflicting views of the objectives of a course one from the syllabus, one from his teacher (s); and one from the examination. Objectives which are unnecessarily imprecise can increase this conflict and lead to anxiety lower performance and a bad self-image. Yet if teaching and learning are to form part of single co-operative process the teacher and his students will need to share a common statement of objectives. In some cases this statement may be all the teaching that is required; because, given adequate resources, a student, as an intelligent being, can achieve them alone. In others, it will help to increase student initiative, to develop student capacity for self-evaluation and to encourage co-operation between students.

The importance of objectives for co-operation between teachers should also be noted. The increasing emphasis being placed on the interrelationships between different areas of knowledge needs to be translated into the curriculum; and this has to mean more than expecting students to derive integrated patterns while their teachers preserve a segmented course structure. Yet a course cannot easily be linked together to form a coherent curriculum if their objectives are undefined.

Evaluation in higher education tends to be associated with grading or discriminating between students, and it can fulfil this function irrespective of whether or not there is a mis-match between the objectives of the course and the methods of evaluation employed. Such a mis-match, however, militates against improvement in the quality of teaching and learning. It is not uncommon for a faculty to complain that their students learn everything by rote and do not think for themselves, although the examinations set by the same teachers encourage precisely this kind of behaviour. The student is left to try and guess what is really required; and without any adequate feedback in the form of objective-linked evaluation to guide him as he learns. The most neglected aspect of evaluation, however, is its role in providing information about the quality of teaching. We have already emphasized the need for improvements in the quality of teaching without increases in cost. Yet no one can even tell if any improvement has taken place unless it is possible to compare a statement of objectives with some form of assessment of how adequately they have been achieved. Increased scores on a test are of little use if the test does not measure the appropriate objectives. It cannot be too strongly emphasized that if evaluation is to contribute to problems of teaching and learning and not to remain merely an administrative convenience for disciplining and grading students it will have to be based on precisely formulated statements of objectives.

# SECTION FIVE

## DESIGN OF SEMESTER SYSTEM

## THE DESIGN OF SEMESTER SYSTEM

The Research Cell of the Association of Indian Universities undertook an investigation into a rational and scientific method of semester system for universities. A questionnaire for this research study and investigation was prepared and it was mainly intended to solicit the reactions of teachers with a view to identifying components of semester system in their respective universities and helping them indicate their choice of methods for adopting the semester system. A draft design of formats for use with various components of semester system was given and the teachers were to indicate their responses to the accompanying questions. Many colleges in different universities have since adopted this method of having a group of teachers teaching the same subject with a specified number of years of teaching experience to go through the questionnaire individually and then working out a consensus in respect of responses to (a) choice and ranking of objectives, (b) choice of objectives for semester system, (c) choice of tools of evaluation and weightages to these components of internal assessment and finally. (d) choice of formats, design details to put every component of semester system into practice.

The questionnaire is given below in a complete form to enable universities wishing to use it for designing their semester system. Every year this can be referred to teachers (as many as possible) and after a consensus design is worked out it is circulated to them. As a result, the teachers will feel that they are a part & parcel of the system in so far as they jointly develop their own design. The experience of working with teachers in some universities in the country reveals that they appreciate such responsibility. A design created by teachers out of their own experience will not only be more acceptable to both but is also likely to throw up fresh ideas on the whole subject of the semester system.

RESEARCH CELL
ASSOCIATION OF INDIAN UNIVERSITIES
NEW DELHI

## QUESTIONNAIRE

**SEMESTER SYSTEM PROJECT** **STAGE III**

The Research Cell of the Association of Indian Universities is engaged in exploring a rational method of Semester System for university courses in our country. This questionnaire is mainly intended to solicit the views of university teachers on certain important issues concerning semester system with a view of providing a rational and scientific design. This document is divided into three sections:

| | |
|---|---|
| Section I | A short note on semester system |
| Section II | Bio data of teachers |
| Section III | Questionnaire soliciting views |

The information supplied by teachers, will be used to produce a Monograph on semester system, incorporating the views of teachers and providing a design of semester system for various courses.

## SECTION I

## A NOTE ON SEMESTER SYSTEM

The Inter-University Board of India (now Association of Indian Universities) in its National Seminar on Examination Reform in Higher Education, among many things suggested a reorganisation of courses to introduce semester and trimester system of functioning in the universities, The University Grants Commission also, concerned as it is with the "promotion and coordination of university education and the determination and maintenance of standards of teaching, examination and research in universities" has been devoting special attention to problems relating to reorganisation of courses and reforms in examinations. As far back as September 1957, the commission appointed a committee for reviewing the examination system of the universities and for suggesting necessary improvements. The report of the committee underlined the fact that "teaching, learning and examination constitute a unity of functions" and suggested various measures for reform of the examination system.

The Education Commission (1964-66) has stressed the need for improving teaching and evaluation methods and introducing an element of flexibility in the selection of courses so that students have more freedom of choice and the present tendency to memorise more information is drastically reduced.

A recent suggestion that has been put forward in order to realize some of the above objectives is the introduction of "SEMESTER SYSTEM". This, if done in a coordinated and systematic manner, is likely to initiate a process of modernization and improvement in both the teaching and learning processes, apart from bringing about the needed reform and flexibility in course content and techniques of evaluation.

It may be noted in this connection that a number of universities have already introduced the semester system, either in all the faculties or in some selected faculties. Others are in the process of introducing it. Based on the successful implementation of semester system in a few universities, like Aligarh Muslim University and Meerut University, the University Grants Commission instituted a committee to prepare a draft proposal on semester system implementation in various universities and circulate the details to various universities.

Details of semester system in different universities

The total number of Indian universities = 126 (Including Agricultural Universities, deemed universities and institutions of National importance)

Universities adopting semester or trimester system = 80

All the Agricultural Universities, except the J. N. Krishi Vidhyalaya, Jabalpur, are following only trimester system and not semester system.

Semester system is followed in all the universities known in the Faculty of Engineering and Technology and Faculty of Medicine. In some universities only undergraduate courses have semester system; in some, only P. G. courses have semester system; in some others both undergraduate and postgraduate have semester system. In certain universities only a few subjects in the different faculties like Arts, Science and Commerce have semester system.

The Shorter Oxford English Dictionary gives the following meaning of the word "semester".

"A period of term of six months, especially in German Universities and some United States' Colleges, the college half year".

It is thus clear that the semester signifies the division of academic year into two parts. Division of the academic year also implies that courses are designed to cover one semester (instead of a year) and that final examinations are held twice a year.

There are many merits associated with the system:

a) The quantities of content in various subjects would be proportioned suitably into semesters.

b) This helps students to achieve their objectives in a better way.

c) There is greater freedom to change the subjects and the combinations even in the middle of the course.

d) There is flexibility to choose the number of courses in every semester between two and seven.

e) Continuous assessment being an important component of semester system encourages the students to work systematically throughout the course.

f) There is increased self reliance on the part of students in respect of schedule, evaluation and performance improvement.

g) Shortage of attendance in a subject is no bar to the student taking examinations in other subjects where attendance required is fulfilled.

h) Continuous internal assessment with more emphasis on abilities that are not tested by a semester examination forms an integral part of the system.

i) It is therefore necessary to keep internal assessment and external semester examination marks/grades separate.

j) Students have the opportunity to discuss their answers in all accepted tools of internal evaluation. This adds to reliability.

k) One of the components of Internal Assessment, namely periodical tests, prepares students continuously for the final examination, thereby eliminating the fear of the unknown.

l) Semester system does include improved methods of assessing student performance in semester examination, making increased use of objective type testing.

m) A Question Bank, if made available, will help in the effective implementation of semester system.

n) In a semester system, there is increased rapport and relationship between teachers and students

There are several other features which, though they are not necessary concomitants of the semester system, are often associated with it. Those of major importance are the "CREDIT SYSTEM", the system of "LETTER GRADES", greater reliance on home study, INTERNAL ASSESSMENT, and use of Question Bank, improved Methods of Assessment etc.

Projects have already been completed on the letter grades and the internal assessment by the Research Cell, Association of Indian Universities. It is now proposed to involve teachers in various universities to respond to a questionnaire on Semester System and help in designing the system.

So, an elaborate discussion on the "Credit System" could help to a certain extent to understand the semester system.

## CREDIT

The Credit-System is basically a system for simplifying what has been called" academic book keeping". A student earns his diploma by accumulating a specified number of academic credits instead of attending for a specified number of years. Thus a part-time student may spread out his studies over several more years than normal, while a specially brilliant may occasionally take a heavier than normal load and shorten his education by a semester or so. A university usually prescribes that a certain minimum number of credits must be obtained in the student's main department. The distribution of the remaining credits may be unrestricted, or it may be restricted in accordance with any scheme which the university may desire. For example, one university may require that almost all of the non-departmental credits be taken in courses which the department considers supplementary or relevant to the main while another may want to burden students by requiring, in addition to the main, minimum of at least six credits each in pure sciences, social sciences, humanities and modern language. It is thus evident that the credit system has the effect of adding considerably to the flexibility allowed by the semester organization of the academic schedule.

The semester credit hour is defined as a unit for expressing quantitatively the content of a course at the level of higher education. The most widely accepted meaning of a credit is that a student earns one credit by attending one 50 minute period of lecture class instructions and doing 2 to 3 hours of home study, each week throughout one semester (15-18 weeks). Thus the terms 'credit' and'semester hours' are often used inter changeably. The credit system allows great flexibility in fitting course time to the particular subject taught. Most semester courses carry 2 to 4 credits each.

Credits do not always require a particular number of class periods. Since one hour of theory class is expected to be supplemented by 2 to 3 hours of home study, it is considered equivalent to three hours of laboratory practical work. Similarly, 2 or 3 credits per week may be allowed for a thesis which involves no class-attendance at all. A full time student making normal progress will complete 30 to 32 semester credit hours of course work in an academic year of 9 months. To obtain a bachelor's degree in a three year college, a student must normally accumulate 90-94 semester hours.

Another feature incidentally associated with the semester system is a greater reliance of home study. Since a great deal more can be covered in an hour of reading than in an hour of speech, the lecturer does not expect to "cover the course" in his lecture and in fact the lectures often contain only supplementary material not available in books. The student is expected to read and study 300-600 pages every week of the semester (Except examination week). Thus a student in full time attendance is generally required to attend 15 or 16 hours of lecture classes/week which is supplemented by home study, and this amounts to 40 to 50 hours/week for an average student.

The main advantage of organizing courses on the credit system is the flexibility it permits to students intensively as also extensively to cover a wide range of subjects. The courses can be adjusted to the needs and abilities of individual students. The selection of a course is done with the utmost care and in consultation with the adviser concerned. The adviser ensures that preparatory courses are taken in the first or second semester. It is also ensured that nearly 2/3rds of the course credits is from the subject in which the student intends to major at the end of the first two years of general education programme. The student is also allowed to offer some courses for which no credit may be given. Generally speaking a student is required to offer not less than 9 credit courses and not more than 16 credit courses in one semester.

### —Precautions to be taken before the implementation of the semester system.

Teaching is a highly complex and sophisticated science requiring not only the knowledge of a particular discipline but also the ability to analyse, synthesise, evaluate, communicate, demonstrate, show application, draw analogies and finally promote learning in the class rooms, laboratories and field. While few individuals possess this ability without the benefit of training, it has been proved beyond doubt that good teachers can be made and are being made out of training; so, before the implementation of the semester system, teachers must undergo training for some period to understand the details regarding the semester system, acquire skills and competences to adopt the system.

However, modern educators feel that good teaching is that which ensures effective learning. The premium must therefore be on effective learning; so before the implementation of the semester system students must be made to know some details about the semester system.

A rational and scientific semester system implementation has certain implications on Syllabus (Curriculum), Teaching methods, Evaluation methods etc.

The framing of the syllabus for semester system is not done by simply breaking the old traditional syllabus into two halves. The areas like content and ability have to be taken into consideration.

In terms of content

Content areas for the earlier semesters have to be of lower order involving information; complex areas may be included for the later semesters.

In terms of ability

Similarly, the preliminary areas must deal with the simpler abilities, like comprehension and knowledge, while the later ones must deal with more complicated intellectual abilities like application, analysis, synthesis and evaluation. By and large, there must be a built-in continuity in respect of both content and abilities.

Teaching methods

The traditional method, i.e. lecturing, must be given secondary importance and more number of hours have to be allotted for assignment, tutorial, discussion and project, laboratory work, home study because intellectual abilities of higher order like Application, Analysis, Synthesis, Evaluation and affective abilities like Interest, Motivation, Attitudes, Team work are all developed only by these methods.

One other important implication of semester system is that better and effective methods of student performance during and at the end of the semester are to be adopted. Internal continuous assessment for abilities and skills that are not tested by end semester examinations, must be given proper weightage and there should be increasing objectivity in the tools of evaluation.

Section II Biodata of Teacher

2.1 Name of Teacher :

2.2 Name of College :

2.3 Name of University :

2.4 Number of affiliated colleges : ☐

2.5 Number of affiliated colleges having semester system : ☐

2.6 Number of affiliated colleges having your subject : ☐

2.7 Your subject of specialisation

2.8 Courses taught in your college (indicate them with a tick in the Box I at first degree level and Box II at post Graduate level) :

| | | I | II | | | I | II |
|---|---|---|---|---|---|---|---|
| 1. | Mathematics | ☐ | ☐ | 11. | Sociology | ☐ | ☐ |
| 2. | Physics | ☐ | ☐ | 12. | Pol. Science | ☐ | ☐ |
| 3. | Chemistry | ☐ | ☐ | 13. | English Language | ☐ | ☐ |
| 4. | Botany | ☐ | ☐ | 14. | Engineering | ☐ | ☐ |
| 5. | Zoology | ☐ | ☐ | 15. | Medicine | ☐ | ☐ |
| 6. | Psychology | ☐ | ☐ | 16. | Agriculture | ☐ | ☐ |
| 7. | Geography | ☐ | ☐ | 17. | Law | ☐ | ☐ |
| 8. | Economics | ☐ | ☐ | 18. | Library Science | ☐ | ☐ |
| 9. | History | ☐ | ☐ | 19. | Vet. Science | ☐ | ☐ |
| 10. | Commerce | ☐ | ☐ | 20. | Other Subjects (Mention name) | ☐ | ☐ |

2.9 Number of years of Teaching : Graduate Level ☐

P.G. Level ☐

2.10 Are you involved in teaching semester system courses : Yes ☐ No ☐

If 'Yes', give details of your present semester system.

Course and Subject Components of Semester System

## QUESTIONNAIRE

### Section III

In all the items that follow a series of statements is given. You have to respond with a tick in the box appropriately.

3.1 The quantities of content in various subjects should be proportioned suitably into semester.

☐ agree ☐ disagree ☐ feel uncertain

3.2 This helps students to achieve their objectives in a better way.

☐ agree ☐ disagree ☐ feel uncertain

3.3 There is greater freedom to change the subjects and the combinations even in the middle of the course.

☐ agree ☐ disagree ☐ feel uncertain

3.4 There is flexibility to choose the number of courses in every semester between two and seven.

☐ agree ☐ disagree ☐ feel uncertain

3.5 Continuous assessment being an important component of semester, it encourages the students to work systematically throughout the course.

☐ agree ☐ disagree ☐ feel uncertain

3.6 There is increased self reliance on the part of students in respect of schedule, evaluation and performance improvement.

☐ agree ☐ disagree ☐ feel uncertain

3.7 Shortage of attendance in a subject is no bar to the student taking examinations in other subjects where attendance required is fulfilled.

☐ agree ☐ disagree ☐ feel uncertain

3.8 Continuous internal assessment with more emphasis on abilities that are not tested by semester examination forms as integral part of the system.

☐ agree ☐ disagree ☐ feel uncertain

3.9 It is therefore necessary to keep internal assessment & external semester examination marks/grades separate.

☐ agree ☐ disagree ☐ feel uncertain

3.10 Students have the opportunity to discuss their answer in all accepted tools of internal evaluation. This adds to reliability.

☐ agree ☐ disagree ☐ feel uncertain

3.11 One of the components of Internal Assessment, namely periodical tests, prepares students continuously for the final examination, thereby eliminating the fear of the unknown.

☐ agree ☐ disagree ☐ feel uncertain

3.12 Semester system does include improved methods of assessing students performance in semester examination, making increased use of objective type testing.

☐ agree ☐ disagree ☐ feel uncertain

3.13 Question Bank if made available will help in an effective semester system implementation.

☐ agree ☐ disagree ☐ feel uncertain

3.14 In a semester system, there is increased rapport and relationship between teachers and students.

☐ agree ☐ disagree ☐ feel uncertain

4.1 From an intimate knowledge of your college, (kind of students admitted, their general ability and the results produced) in what group Achievement level would you put your college?

Group Achievement Level

| I | II | III | IV | V | VI | VII | VIII | IX |
|---|---|---|---|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

Note: Put a tick in the box against V if you consider your college to be average. Similarly VI or VII if your college is above average; VIII or IX if your college is good; III or IV below average; I or II poor. This is essentially your judgement.

4.2 Put a tick against your subject for semester system design:

A Mathematics ☐
B Physics ☐
C Chemistry ☐
D Botony ☐
E Zoology ☐
F Psychology ☐

G. History ☐
H. Geography ☐
I. Economics ☐
J. Commerce ☐
K Others (Indicate the subject) ☐

4.3 Checklist below gives a list of out-comes of learning the subject at graduate/ P.G. Level. If the Item exists, put a tick in the box close to the item. In the second box, indicate the rank order of priority you will give for the selected items.

e.g. comprehension ☑ 2 . This mean according to you, comprehenstion exists and the rank is 2.

| SEMESTER | GRADUATE I | | POST GRADUATE I | |
|---|---|---|---|---|
| 1. Knowledge | ☐ | ☐ | ☐ | ☐ |
| 2. Comprehension | ☐ | ☐ | ☐ | ☐ |
| 3. Application | ☐ | ☐ | ☐ | ☐ |
| 4. Synthesis | ☐ | ☐ | ☐ | ☐ |
| 5. Analysis | ☐ | ☐ | ☐ | ☐ |
| 6. Evaluation | ☐ | ☐ | ☐ | ☐ |
| 7. Drawing Skills | ☐ | ☐ | ☐ | ☐ |
| 8. Handling Skills | ☐ | ☐ | ☐ | ☐ |
| 9. Communication Skills | ☐ | ☐ | ☐ | ☐ |
| 10. Social Skills | | | | |
| a. team work | ☐ | ☐ | ☐ | ☐ |
| b. Leadership | ☐ | ☐ | ☐ | ☐ |
| 11. Personal | | | | |
| a. Regularity | ☐ | ☐ | ☐ | ☐ |
| b. Hardwork | ☐ | ☐ | ☐ | ☐ |
| c. Originality | ☐ | ☐ | ☐ | ☐ |
| d. Initiative | ☐ | ☐ | ☐ | ☐ |
| e. Inventiveness | ☐ | ☐ | ☐ | ☐ |
| 12. Interest | ☐ | ☐ | ☐ | ☐ |
| 13. Positive and Scientific attitude | ☐ | ☐ | ☐ | ☐ |
| 14. Appreciation | ☐ | ☐ | ☐ | ☐ |
| 15. Creativity | ☐ | ☐ | ☐ | ☐ |

3.4 Checklist below indicates abilities that are to be tested. Put a tick in the first box if you think that the ability is to be tested by paper and pencil end of semester-external examination. Enter second box with a tick for the ability that you consider must be assessed continuously, periodically, internally, by teachers adopting several techniques.

| SEMESTER | GRADUATE I | | POST GRADUATE I | |
|---|---|---|---|---|
| 1. Knowledge | ☐ | ☐ | ☐ | ☐ |
| 2. Comprehension | ☐ | ☐ | ☐ | ☐ |
| 3. Application | ☐ | ☐ | ☐ | ☐ |
| 4. Analysis | ☐ | ☐ | ☐ | ☐ |
| 5. Synthesis | ☐ | ☐ | ☐ | ☐ |
| 6. Evaluation | ☐ | ☐ | ☐ | ☐ |
| 7. Drawing Skills | ☐ | ☐ | ☐ | ☐ |
| 8. Handling Skills | ☐ | ☐ | ☐ | ☐ |
| 9. Communication skills | ☐ | ☐ | ☐ | ☐ |
| 10. Social skills | | | | |
| a. Team work | ☐ | ☐ | ☐ | ☐ |
| b. Leadership | ☐ | ☐ | ☐ | ☐ |
| 11. Personal | | | | |
| a. Regularity | ☐ | ☐ | ☐ | ☐ |
| b. Hard Work | ☐ | ☐ | ☐ | ☐ |
| c. Inventiveness | ☐ | ☐ | ☐ | ☐ |
| d. Originality | ☐ | ☐ | ☐ | ☐ |
| e. Initiative | ☐ | ☐ | ☐ | ☐ |
| 12. Interest | ☐ | ☐ | ☐ | ☐ |
| 13. Positive and scientific attitude | ☐ | ☐ | ☐ | ☐ |
| 14. Appreciation | ☐ | ☐ | ☐ | ☐ |
| 15. Creativity | ☐ | ☐ | ☐ | ☐ |

4.5 Below is given a list of methods that can be employed to evaluate the abilities listed in 4.4. Put a tick in the first box if you consider it relevant for your subject. If you have to distribute 100 marks to all the selected methods, indicate the marks you would allot to each one of these by putting the number in the second box.

| | | |
|---|---|---|
| 1. Quiz announced | ☐ | ☐ |
| 2. Quiz unannounced | ☐ | ☐ |
| 3. Short duration objective type tests. | ☐ | ☐ |
| 4. Short answer essay/problem solving | ☐ | ☐ |
| 5. Long answer essay | ☐ | ☐ |
| 6. Class assignments/tutorials | ☐ | ☐ |
| 7. Home assignments | ☐ | ☐ |
| 8. Guided individual project | ☐ | ☐ |
| 9. Guided group project | ☐ | ☐ |
| 10. Lab. /field/Practical work | ☐ | ☐ |
| 11. Observation | ☐ | ☐ |
| 12. Checklists | ☐ | ☐ |
| 13. Rating scales:interest | ☐ | ☐ |
| 14. Rating scales:attitude | ☐ | ☐ |
| 15. Group discussion | ☐ | ☐ |
| 16. Seminar | ☐ | ☐ |
| 17. Thesis/Dissertation | ☐ | ☐ |

4.6 Below is given the individual assessment for the above mentioned 1 to 10 in the section 4.5. For the chosen assessment tests from 1 to 10, enter your answers in the boxes below:

| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Indicate the number of assesment you propose to give during a semester | | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 2. Indicate their duration in Mts. | | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 3. Do you think that extra preparation and time is required on your part? | Yes: | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| | No: | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

## SYLLABUS ANALYSIS

In the realm of education, administrators, teachers and examiners depend completely on the syllabus document for their respective functions of specifying, recognizing and awarding, teaching and examining. It may sound ironical, but the fact remains, that the process of producing such a document is being given superficial consideration. This process has been mostly segmental, highly casual and often ad-hoc. With this kind of casual approach to one of the dominating elements, the casualities are the teaching performance of the teachers and the learning attainment of students. Moreover, very often the syllabus does not specify even the content areas fully and clearly. In addition, the syllabus does not at all indicate the intellectual abilities & skills to be developed by students. In fact this syllabus as it obtains now is extremely inadequate.

The three elements that are easily identified in the existing education system are (i) syllabus, (ii) Teachers students facilities, and (iii) examinations. Syllabus, therefore is the dominating element in this system. What is a syllabus?

Most of us know that syllabus is a document which contains (i) a number of names of major topics (ii) Secondary topics for each major topic (iii) sometimes, time allotted for coverage of the syllabus. One can analyse any syllabus to obtain its limit in clarity by subjecting it to the following basic questions. Does the syllabus indicate answers to any of the following? What, Why and How should a teacher teach and How does the teacher know what he has taught ~~it~~? These basic questions can be expanded with specific items of enquiry, to bring in a reasonable quantum of objectivity in the analysis; and then it is possible to quantify the clarity of a syllabus by a suitable analysis proforma. One such performa is shown below:

"How clearly the syllabus provides guidance"can be determined by the teacher by answering the questions listed below:

Syllabus Analysed Clearly Stated Not Clear

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 5.1 | What should the teacher teach? | | | | | | Score out of | Total | Coeff. of clarity |
| | | 5 | 4 | 3 | 2 | 1 | | | |
| | a. All subject matter | | | | | | | | |
| | b. Activity of student | | | | | | | | |
| | c. Link with other subjects | | | | | | | | |
| | d. Depth of Treatment | | | | | | ☐ | 20 | ☐ |
| 5.2 | Why Should the Teacher Teach? | | | | | | | | |
| | a. Industrial, life Examples given. | | | | | | | | |

| | | 5 | 4 | 3 | 2 | 1 | | | |
|---|---|---|---|---|---|---|---|---|---|
| | b. Students' skills, abilities to be developed | | | | | | | | |
| | c. Students'knowledge to be developed | | | | | | | | |
| | d. Students' social skills to be developed | | | | | | ☐ | 20 | ☐ |
| 5.3 | How should the teacher Teach? | | | | | | | | |
| | a. Method of teaching | | | | | | | | |
| | b. Teaching/learning aids | | | | | | | | |
| | c. Time allocation | | | | | | | | |
| | d. Class room organisation | | | | | | | | |
| | e. Lesson Plans | | | | | | | | |
| | f. Method of Evaluation | | | | | | ☐ | 30 | ☐ |
| 5.4 | How does the teacher know what he has taught? | | | | | | | | |
| | Class room | | | | | | | | |
| | a. Type of test | | | | | | | | |
| | b. Frequency of test | | | | | | ☐ | 10 | ☐ |
| | Laboratory | | | | | | | | |
| | a. Type of test | | | | | | | | |
| | b. Frequency | | | | | | ☐ | 10 | ☐ |
| | Syllabus indicates students' | | | | | | | | |
| | a. Academic abilities | | | | | | | | |
| | b. Psycho-motor skills to be tested | | | | | | ☐ | 10 | ☐ |
| | | | | TOTAL | | | ☐ | 100 | ☐ |

| | |
|---|---|
| APPARANT OVERALL CO-EFFICIENT OF CLARITY | |

An analysis of the type indicated in the article 5 reveals the following deficiences of a traditional annual system of syllabus.

5.5 Production process by which the syllabus orginates is too segmental, mostly casual and frequently ad-hoc.

☐ agree ☐ disagree ☐ feel uncertain

5.6 Lack of emphasis on priorities and time allocations.

☐ agree ☐ disagree ☐ feel uncertain

5.7 Constraint in teaching order.

☐ agree ☐ disagree ☐ feel uncertain

5.8 No integration of different subjects of study.

☐ agree ☐ disagree ☐ feel uncertain

5.9 All the above, four lead to narrow compartmentalisation and disjointed presentation.

☐ agree ☐ disagree ☐ feel uncertain

5.10 The syllabus does not indicate the abilities and skills. In the absence of this, examinations are normally used to define the abilities and from this, emerges very often a single ability 'to remember specifics'.

☐ agree ☐ disagree ☐ feel uncertain

5.11 As there is no identification of abilities to be developed in the students, there is no link between teaching method and syllabus. As a result, most of the teaching strategies degenerate into a stereotype lecture with teacher domination.

☐ agree ☐ disagree ☐ feel uncertain

5.12 The inadequacies of this type of syllabus-examination approach to our system of education will lead to the deterioration of the quality of the students coming out of the system with the consequent under-employment or unemployment of them.

☐ agree ☐ disagree ☐ feel uncertain

5.13 The "syllabus examination" approach is to be replaced by an approach based on the development of needed abilities through appropriate learning experiences content or subject matter. In such an approach will then appear a framework in which the desired abilities may be developed.

☐ agree ☐ disagree ☐ feel uncertain

5.14 Even an existing syllabus can be qualitatively improved by the method suggested above if one can identify major ability classes to be developed in each of the major topic of the syllabus and accord judicious weightages to these abilities.

A new dimension, one of the important missing elements of the traditional syllabus of even rationally identifying the abilities and skills, can thus be added. This additional dimension of abilities and skills enables the teachers and examiners to orient their respective functions more rationally and logically than is possible with a traditional syllabus.

Below is given a list of abilities/skills involved in 'learning' subjects at Graduate/ Post Graduate levels. Put a tick in the first box if the item exists & among the selected items give a rank order in the next box

A typical proforma for this activity is given below:-

| | | | |
|---|---|---|---|
| 1. | Ability to identify the relationship in different situations. | ☐ | ☐ |
| 2. | Ability to reproduce verbally laws and principles | ☐ | ☐ |
| 3. | Ability to work to given instructions | ☐ | ☐ |
| 4. | Ability to recall factual knowledge | ☐ | ☐ |
| 5 | Knowledge of ways of using apparatus | ☐ | ☐ |
| 6. | Knowledge of history of Science and Technology | ☐ | ☐ |
| 7. | Ability to verbalise symbolic relationship | ☐ | ☐ |
| 8. | Ability to apply generalisations to new situations | ☐ | ☐ |
| 9. | Ability to use simple apparatus | ☐ | ☐ |
| 10. | Ability to speculate to exercise imagination in problem solving | ☐ | ☐ |
| 11 | Ability to record appropriately the observed structure or system and the changes occuring in it | ☐ | ☐ |
| 12. | Knowledge of definitions of Physical quantities | ☐ | ☐ |
| 13. | Ability to predict on the basis of given data | ☐ | ☐ |
| 14. | Ability to recognise problems that lend themselves to scientific treatment | ☐ | ☐ |
| 15. | Ability to draw conclusions | ☐ | ☐ |
| 16. | Ability to devise novel procedures to solve a practical problem | ☐ | ☐ |
| 17. | Knowledge of relationships between laws and specific phenomena | ☐ | ☐ |
| 18. | Knowledge of Technical terms | ☐ | ☐ |

| | | | |
|---|---|---|---|
| 19. | Ability to plan experiments and test hypothesis | ☐ | ☐ |
| 20. | Ability to pursue experimental enquiry | ☐ | ☐ |
| 21. | Knowledge of specific facts. | ☐ | ☐ |
| 22. | Knowledge of general principles | ☐ | ☐ |
| 23. | Skills in drawing, deciphering and reading. | ☐ | ☐ |
| 24. | Knowledge of conventions | ☐ | ☐ |
| 25. | Ability to give specific examples of scientific principles. | ☐ | ☐ |
| 26. | Ability to use measuring instruments to stipulated accuracy. | ☐ | ☐ |
| 27. | Ability to select, evaluate and apply information in relation to problems | ☐ | ☐ |
| 28. | Ability to make inferences from data presented in graphic form | ☐ | ☐ |
| 29. | Ability to distinguish between observational and experimental facts on the one hand and explanatory theories on the other. | ☐ | ☐ |
| 30. | Ability to verify facts already taught. | ☐ | ☐ |
| 31. | Ability to express clearly, specifically in written, spoken form | ☐ | ☐ |
| 32. | Ability to work as a member of a team in discussion, group work, lab./practical work | ☐ | ☐ |

5.15 Syllabus has to be framed by the teachers who are "professional" and those who are trained in the science of syllabus preparation. Do you,

☐ agree ☐ disagree ☐ feel uncertain

5.16 Some view that there must be a frequency in updating the syllabus. In your subject, according to you, which would you like? (i) change every year (ii) change once in two years. (iii) change whenever needed.

(i) ☐ (ii) ☐ (iii) ☐

5.17. Everytime, when the syllabus is changed, there must be addition of new topics and deletion of outdated topics.

☐ agree ☐ disagree ☐ feel uncertain

5.18 The new addition to the syllabus should be the upto date advancements in the subjects concerned.

☐ agree ☐ disagree ☐ feel uncertain

5.19 Syllabus has to be framed on content topics only.

☐ agree ☐ disagree ☐ feel uncertain

5.20 In the conversion of the traditional annual syllabus into a semester system of syllabus, the former can be broken exactly into two similar portions to get the syllabus for two semesters and the I portion is kept for I semester and II one for the II semester.

☐ agree ☐ disagree ☐ feel uncertain

5.21 By doing the method mentioned in 5.20, continuity in the subjects will be there and in the examination for the second half of the 2nd semester course, a student is not expected to have forgotten the first half, and questions asked for integration of the two are not considered out of order.

☐ agree ☐ disagree ☐ feel uncertain

5.22 In the semester system of teaching, the contents and abilities to be developed in students are the two important factors. So, the preliminary areas included in earlier semester must be introductory in character, (abilities like knowledge/ comprehension etc.) with the simpler contents and the syllabuses for later semesters deal with higher order abilities like application, analysis synthesis and evaluation with some complicated contents. Do you,

☐ agree ☐ disagree ☐ feel uncertain

Teaching-Learning activities

The different activities listed below are not necessarily mutually exclusive or isolated: they may be undertaken one at a time or in combination as appropriate. There are about 14 questions regarding teaching-learning activities given below. After each question, there are two boxes. In the first box, you put a tick, if you consider it necessary for the semester system of teaching and in the second box you write the weightage you would give for them.

Example:- formal style, controlled language logical structure

☑ [25%]

(This means that you agree with the formal style, controlled language and logical structure in giving a lecture and the weightage you give for the lecture is 25% i.e. only 25% of the teaching is achieved by the lecture.)

| | | | | |
|---|---|---|---|---|
| 6.1 | Lecture | | | |
| | (a) | formal style, controlled language logical structure | ☐ | ☐ |
| | (b) | informal style, conversational language, inductive approach. | ☐ | ☐ |
| | (c) | conversational (dialogue) style (with frequent questions and answers) | ☐ | ☐ |
| 6.2 | Class discussion | | | |
| | (a) | formal, controlled by the teacher, through questions and answers with teacher-students interactions. | ☐ | ☐ |
| | (b) | informal, permissive atmosphere, voluntary participation under guidance, teacher-student and student - student interactions | ☐ | ☐ |
| | (c) | short structured, purposeful, pinpointed 'buzz sessions' with small groups (on some specific question) followed by reporting to the whole class. | ☐ | ☐ |
| | (d) | purposeful, structured group discussion (followed by reporting to the whole class and general discussion.) | ☐ | ☐ |
| | (e) | group work (discussion and experimental or productive effort.) | ☐ | ☐ |
| 6.3 | Team Teaching | | | |
| | (a) | shared/divided teaching (with or without interaction between the members. | ☐ | ☐ |
| | (b) | symposium type (diff. members presenting/discussing different aspects) | ☐ | ☐ |
| | (c) | panel discussion type (with members supplementing and interacting and also discussing with the class). | ☐ | ☐ |
| | (d) | a major presentation to a large group followed by group discussion; each group with a teacher (may first adopt an inter disciplinary approach where applicable followed by discussion on specialities) | ☐ | ☐ |
| 6.4 | Tutorial/discussions | | | |
| | (a) | with individual students | ☐ | ☐ |
| | (b) | with small group | ☐ | ☐ |

6.5 Recitations (Recitations from memory, or reading or repetition of presented material)

a) individual ☐ ☐

b) group (shared or in chorus) ☐ ☐

6.6 Projects (Studies, expts; production, or any other purposeful and planned activity)

a) Guided individual projects ☐ ☐

b) Guided group projects ☐ ☐

c) Independent individual projects ☐ ☐

d) Independent group projects ☐ ☐

6.7 Experiments

a) Instructed/guided, supervised ☐ ☐

b) Guided but not supervised ☐ ☐

c) Independently planned and conducted (before learning related theory or after learning them but without specific instructions on procedure. ☐ ☐

6.8 Supervised/independent study

a) guided and supervised study ☐ ☐

b) guided and not supervised study ☐ ☐

c) Independent study (or specific assignments) ☐ ☐

d) Independent study (without assignments and on one's own choice). ☐ ☐

6.9 Use of structured/programmed instructional learning material

a) Well structured lessons/material (logically presented in text book style) ☐ ☐

b) Material in informal conversational style ☐ ☐

c) Material in dialogue form ☐ ☐

d) Programming consisting of short presentations followed by response items of each. ☐ ☐

e) Step wise (frame by frame) programming with response and feed back at each step) ☐ ☐

6.10 Assignments

a) Theoretical-Essay, etc (individual) ☐ ☐

b) Theoretical-essay, etc (group) ☐ ☐

c) Practical-expts; collection, planning etc. (individual) ☐ ☐

d) Practical-expts, collection, planning etc, (group) ☐ ☐

e) Problem solving exercises ☐ ☐

6.11 Students Seminars

a) Preparation and presentation of papers. ☐ ☐

b) Leading, discussions (and answering question) ☐ ☐

c) Symposia ☐ ☐

d) Panel discussion ☐ ☐

6.12 Workshop method

(Combining theoretical presentations/discussion by teachers, use of appropriate aids, group discussion and work productive effort, group presentations and general discussion, review etc.) ☐ ☐

6.13 Manipulative exercise/performance experience

a) examinations/observation of specimens, models, etc. with or without tools. ☐ ☐

b) limited participations in process ☐ ☐

c) exercise/process experience with increasing responsibility (including laboratory experiments and workshop practice - under gradually diminishing guidance. ☐ ☐

6.14 Audio-visual methods

a) Demonstration of processes/expts. ☐ ☐

b) Use of visual aids (graphic projected, three dimensional) ☐ ☐

c) Use of appropriate aids (records etc.) ☐ ☐

d) Use of appropriate audio-visual aids (film, T.V., etc.) ☐ ☐

e) Use of learning laboratories ☐ ☐

f) Field trips (visits, excursions, etc. geared to specific instructional purposes/learning.) ☐ ☐

## EVALUATION

The following are some of the methods of Evaluation and under each method, few questions have been asked. You must put a tick in the first box, if you consider it necessary for the semester system of evaluation and in the second box, you write the weightage you would give for them.

7.1 Oral tests

- a) Quiz (random or structured) ☐ ☐
- b) Viva-voce (covering a balanced sample objectives/content) ☐ ☐
- c) Viva-voce (with sequential and consequential questions for deep probings) ☐ ☐

7.2 Written/paper-pencil tests

- a) Essay/long answer type questions. ☐ ☐
- b) Short essay type question (limited length with considerable specificity of content) ☐ ☐
- c) Short answer type question (with high specificity of content) ☐ ☐
- d) Objective types of items.
  - i) multiple choice ☐ ☐
  - ii) matching ☐ ☐
  - iii) true-false (with or without correction) ☐ ☐
  - iv) multiple facet ☐ ☐
  - v) rearrangement ☐ ☐
  - vi) drawing and or labelling type ☐ ☐
  - vii) modified/combined types (including mastermatching, cluster true false etc.) ☐ ☐
  - viii) marking (in given material) ☐ ☐

7.3 Performance test (practical exams.)

- a) assessment of process (techniques and skills) ☐ ☐
- b) assessment of product ☐ ☐
- c) speech tests, etc. ☐ ☐

| | | | |
|---|---|---|---|
| 7.4 | Observational Techniques (direct and indirect) | | |
| | a) Rating scales | ☐ | ☐ |
| | b) Anecdotal records | ☐ | ☐ |
| | c) Sociometric techniques (sociogram, social-distance scales, etc.) | ☐ | ☐ |
| | d) Observation schedule (for performance) | ☐ | ☐ |
| 7.5 | Questionnaires | | |
| | a) Closed end form | ☐ | ☐ |
| | b) Open end form | ☐ | ☐ |
| 7.6 | Inventories and attitude scales | ☐ | ☐ |
| 7.7 | Checklists (self/reporting/from memory/or observation) | ☐ | ☐ |
| 7.8 | Interviews | | |
| | a) Fact collection | ☐ | ☐ |
| | b) Guidance/counselling | ☐ | ☐ |
| 7.9 | Project techniques | | |
| | (word reactions, sentence completions, picture reactions etc.) | ☐ | ☐ |
| 7.10 | Situational tests (coupled unit observations) | ☐ | ☐ |
| 7.11 | Student self reporting (in appropriate forms) | ☐ | ☐ |
| 7.12 | Exam. of student work products (assignments of different kinds - including term paper, project report, dissertation, etc.) | ☐ | ☐ |
| 7.13 | Observation and rating of participations in seminars, discussion, etc. | ☐ | ☐ |

# ILLUSTRATION OF THE USE OF THE QUESTIONNAIRE TO PRODUCE SEMESTER SYSTEM DESIGN IN VARIOUS SUBJECTS FOR THE INDIAN UNIVERSITIES

Before the questionnaire was administered to a number of teachers of different disciplines assembled during a workshop, a lead lecture focussing their attention on certain basic principles of semester system was given. This was followed by detailed instructions for filling up the questionnaire individually. The number of teachers in different subjects who attended one of the workshops is given below in Table I, w.r.t. their number of years of experience in teaching.

Table I

| S. No. | No. of Year of Teaching | Number of Teachers |
|---|---|---|
| 1. | 0 | 6 |
| 2. | 1 - 5 | 26 |
| 3. | 6 - 10 | 11 |
| 4. | 11 - 15 | 13 |
| 5. | 16 - 20 | 11 |
| 6. | 21 and above | 7 |
| | Total | 74 |

These teachers were drawn from different affiliated colleges and therefore represented a cross section of the teaching community. It took them somewhere between 90 minutes and 120 minutes to complete answering the questionnaire individually. It was possible to consolidate their individual responses to every item and produce a consensus and give it back to them. These things will be illustrated here.

## Section I

This consists of a short note on the semester system in which details like definition of the semester system, components of the semester system like credit, internal assessment, grading, question banking etc. and merits of the semester system, are given briefly.

Section II

This is a biodata of the individual teacher where details like subject of specializations, subject/s taught at both Graduate/ Post Graduate levels, number of years of teaching experience and involvement in some form or other of any semester system are called for.

After collecting responses of individual teachers, it is possible to study the relationships between these and their responses. Of course, such a study is not yet made. However, all the individual responses of teachers of different subjects are collected together and the responses of teachers who have had a definite number of years of teaching experience at the graduate and post-graduate levels (as classified in Table I of this section) are only considered for consolidation and working out consensus.

Section III

This is the actual portion of the questionnaire wherein a series of questions of 3 point scale (agree, disagree, feel uncertain) and 2 point scale (with the first box for putting a tick to indicate whether the item exists and the second one for giving either the rank order or weightage in percentage) is given. They have been classified under different topics such as general, syllabus analysis teaching-learning activities and evaluation etc.

3.1 to 3.14.

There are a series of questions on the merits of the semester system in a 3 point scale. They are explained below:

3.1 The quantities of content in various subjects should be proportioned suitably into semester.

The above statement has been agreed to by 98% of the respondents, only 2% of them have disagreed and none has felt uncertain about it. So, it is highly applicable for the semester system.

3.2 This helps students to achieve their objectives in a better way. 94% of the respondents have agreed, 3% have disagreed and 3% have felt uncertain about it. So this is also applicable for the semester system.

3.3 There is greater freedom to change the subjects and the combinations even in the middle of the course. 53% have agreed, 37% have disagreed and 10% have felt uncertain about it. Though this statement has been agreed to by a majority of the teachers, the percentage of teachers who disagreed is relatively higher. Hence, this statement should be implemented after fuller consideration.

3.4 There is flexibility to choose the number of courses in every semester between two and seven. 72% have agreed 13% have disagreed and 15% have felt uncertain about it. Though three fourths of the teachers have agreed with this statement, as the percentage of 'uncertain' is greater than the 'disagreed', it is necessary to explain the statement to teachers before applying it. A well designed semester system must give this freedom to students.

3.5 Continuous assessment being an important component of semester, it encourages the students to work systematically throughout the course. 99% have agreed, none has disagreed and only 1% has felt uncertain about it. Hence it is highly applicable.

3.6 There is increased self-reliance on the part of the students in respect of schedule, evaluation and performance improvement. 89% have agreed, 2% have disagreed and 9% have felt uncertain about it. This is also applicable and a brief explanation for this statement is needed.

3.7 Shortage of attendance in a subject is no bar to the student taking examination in other subjects where attendance requirement is fulfilled. 90% have agreed, 10% have disagreed and none has felt uncertain. This is also applicable.

3.8 Continuous internal assessment with more emphasis on abilities that are not tested by semester examination forms as integral part of the system. 75% have agreed, 17%have disagreed and 8%have felt uncertain. This is also applicable.

3.9 It is therefore necessary to keep internal assessment and external semester examination marks/grades separate. 87% have agreed, 9%have disagreed and 4% have felt uncertain. This statement is also applicable.

3.10 Students have the opportunity to discuss their answers in all accepted tools of internal evaluation. This adds to realiability. 86% have agreed, 4% have disagreed and 10% have felt uncertain. This is applicable and a brief explanation for this statement is needed.

3.11 One of the components of internal assessment, namely, periodical tests, prepares students continuously for the final examination, thereby eliminating the fear of the unknown. 97%have agreed 3% have disagreed and none has felt uncertain. Hence, this statement is highly applicable.

3.12 Semester system does include improved methods of assessing students performance in semester examination, making increased use of objective type testing. 93% have agreed 5% have disagreed and only 2% have felt uncertain. Hence this is also highly applicable.

3.13 Question Bank if made available will help in an effective semester system implementation. 89% have agreed, 1%has disagreed and 10% have felt uncertain. This is also applicable and it is necessary to give a brief explanation about this statement because the percentage of those who felt uncertain is greater than that of those who have disagreed.

3.14 In a semester system, there is an increased rapport and relationship between teachers and students. 92%have agreed 3% have disagreed and 5% have felt uncertain. Hence this statement is also applicable.

So from statement No.3.1 to 3.14 if we see the total percentage, 87% have totally agreed, 8% have totally disagreed and only 5% have totally felt uncertain. Hence all the14 statements are applicable.

4.1 This is a question to know the Group Achievement Level of the college to which the teacher-respondent belongs. This is essentially his own judgment..

4.2 This is where the individual teacher indicates the subject for semester system design. This is the subject he has been teaching

4.3 A checklist giving a list of outcomes of learning the subject at graduate/postgraduate level is presented. If the individual teacher thinks that an item like application is one of the abilities developed during the teaching/learning process, he will respond with a tick in the first box /✓/ . He will go over the entire check list and choose those that he considers relevant. In the second box, he then indicates the rank order for each one of the selected items (e.g.)3. Application /✓/ /5/. This means according to this teacher, in teaching his subject, application ability is involved and that he/she ranks it 5.

It will now be possible to work out the list of outcomes according to the entire group and also a group rank order can be easily worked out. In all, there are 20 such items and the ranks may range from 1 to 20. For rank 1, allot 20 points, rank 2, 19 points and so on. Sum up for any one item the points given by different individuals. According to the total points secured by each item, work out a group rank order. The group rank order reflects the thinking of all individual teachers and this is acceptable to all of them. Such an analysis is shown in the table No.1 that follows:

## TABLE NO. 1

| S. No. | Abilities/ Experi- ↓ ence → | 0 Yr. | | 1 - 5 Yrs. | | 6 - 10 Yrs. | | 11 - 15 Yrs. | | 16 - 20 Yrs. | | 21 - above | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | I | II | I | II | I | II | I | II | I | II | I | II |
| 1. | Knowledge | 1.4 | 4 | 0.8 | 1 | 4.0 | 13 | 1.0 | 2 | 1.0 | 3 | 2.9 | 2 |
| 2. | Comprehension | 3.4 | 8 | 1.0 | 2 | 2.5 | 8 | 2.0 | 4 | 2.0 | 6 | 1.8 | 1 |
| 3. | Application | 5.2 | 12 | 2.0 | 4 | 4.1 | 14 | 2.3 | 5 | 1.7 | 5 | 3.8 | 8 |
| 4. | Synthesis | 1.2 | 3 | 1.6 | 3 | 2.3 | 6 | 3.1 | 9 | 1.3 | 4 | 3.6 | 6 |
| 5. | Analysis | 4.4 | 11 | 2.6 | 6 | 3.6 | 12 | 3.7 | 12 | 2.7 | 8 | 4.7 | 13 |
| 6. | Evaluation | 1.2 | 3 | 3.0 | 7 | 5.0 | 16 | 4.8 | 14 | 2.3 | 7 | 3.8 | 8 |
| 7. | Drawing skills | - | - | 2.3 | 5 | 0.1 | 1 | 3.4 | 11 | 3.3 | 9 | 3.7 | 7 |
| 8. | Handling skills | 1.6 | 5 | 2.6 | 6 | 0.8 | 3 | 3.1 | 9 | 2.3 | 7 | 3.3 | 4 |
| 9. | Communication skills | - | - | 3.2 | 8 | 3.2 | 10 | 9.0 | 13 | 4.3 | 11 | 2.8 | 3 |
| 10. | Social Skills | | | | | | | | | | | | |
| | a) Team work | 2.4 | 7 | 2.6 | 6 | 2.0 | 5 | 2.7 | 6 | 0.3 | 2 | 3.6 | 6 |
| | b) Leadership | 1.2 | 3 | 3.0 | 7 | 0.9 | 4 | 3.0 | 8 | 2.7 | 8 | 3.4 | 5 |
| 11. | Personal | | | | | | | | | | | | |
| | a) Regularity | 3.8 | 9 | 3.0 | 7 | 3.5 | 11 | 1.4 | 3 | 1.0 | 3 | 4.7 | 13 |
| | b) Hard work | 5.2 | 12 | 3.8 | 9 | 2.3 | 6 | 4.0 | 13 | 1.3 | 4 | 4.6 | 12 |
| | c) Originality | 4.2 | 10 | 3.2 | 8 | 4.4 | 15 | 2.0 | 4 | 4.3 | 11 | 4.3 | 10 |
| | d) Initiative | 3.4 | 8 | 4.2 | 11 | 3.2 | 10 | 2.7 | 6 | 3.3 | 9 | 4.4 | 11 |
| | e) Inventiveness | - | - | 4.6 | 12 | 0.1 | 1 | 2.8 | 7 | 2.0 | 6 | 4.8 | 4 |
| 12. | Interest | 0.40 | 2 | 4.0 | 10 | 0.6 | 2 | 0.1 | 1 | 0.0 | 1 | 5.7 | 15 |
| 13. | Positive and Scientific attitude | 0.20 | 1 | 3.8 | 9 | 2.4 | 7 | 2.3 | 5 | 5.7 | 12 | 4.1 | 9 |
| 14. | Appreciation | 5.4 | 13 | 4.7 | 13 | 2.8 | 9 | 3.3 | 10 | 3.9 | 10 | 6.3 | 16 |
| 15. | Creativity | 2.0 | 6 | 4.2 | 11 | 4.4 | 15 | 3.4 | 11 | 7.0 | 12 | 6.3 | 16 |

First column denotes the value obtained for each item by the calculation. Second column denotes the rank order given according to the calculated value.

## TABLE NO. 2

| Abilities Tested | | K | C | A | An | Syn. | Ev | DS | HS | Cs. | TW | L | R | HW | Inv | Orig | Inv | Int | Ps | App. | Cr. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Exp. 0 | EXT. | *65 | 55 | 45 | 55 | 40 | 60 | 20 | - | 50 | 50 | - | 45 | 20 | - | 45 | 50 | 40 | - | - | 40 |
| | INT. | 45 | 45 | 55 | 45 | - | 20 | 20 | - | 55 | 45 | 60 | 65 | 80 | 20 | 75 | 45 | 100 | - | 40 | 60 |
| 1 - 5 | EXT. | 54 | 51 | 55 | 33 | 45 | 36 | 31 | 23 | 36 | 26 | 15 | 25 | 25 | 25 | 45 | 25 | 20 | 20 | 40 | 45 |
| | INT. | 58 | 45 | 71 | 53 | 39 | 50 | 50 | 51 | 58 | 61 | 43 | 75 | 63 | 61 | 71 | 70 | 67 | 35 | 70 | 75 |
| 6-10 | EXT. | 54 | 73 | 73 | 73 | 54 | 73 | 9 | - | 36 | 18 | 9 | 18 | 36 | 18 | 45 | 9 | 18 | 18 | 18 | 36 |
| | INT. | 45 | 73 | 45 | 36 | 45 | 36 | 18 | 36 | 54 | 45 | 45 | 54 | 100 | 36 | 73 | 63 | 45 | 36 | 54 | 82 |
| 11 - 15 | EXT. | 61 | 29 | 54 | 46 | 36 | 37 | 29 | 28 | 37 | 28 | - | 46 | 46 | 22 | 53 | 42 | 57 | 28 | 42 | 51 |
| | INT. | 68 | 67 | 69 | 45 | 30 | 53 | 29 | 44 | 46 | 44 | 37 | 68 | 60 | 44 | 61 | 53 | 68 | 36 | 61 | 55 |
| 16 - 20 | EXT. | 70 | 70 | 64 | 46 | 22 | 29 | 29 | 12 | 25 | - | 29 | 29 | 23 | 39 | 22 | 22 | 45 | 56 | 22 | 47 |
| | INT. | 81 | 81 | 75 | 62 | 40 | 46 | 25 | 29 | 29 | 29 | 52 | 65 | 42 | 34 | 58 | 63 | 54 | 81 | 29 | 53 |
| 21-above | EXT. | 71 | 71 | 28 | - | 28 | 42 | 28 | 42 | 57 | 14 | - | 42 | 28 | 14 | 14 | 14 | 42 | 57 | 28 | 28 |
| | INT. | 71 | 71 | 28 | 14 | - | 42 | 28 | 28 | 42 | 14 | 14 | 71 | 57 | 42 | 28 | 42 | 42 | 42 | 42 | 42 |

* The percentage of external and internal when added exceeds 100% because some of the teachers have agreed that particular ability to be tested by both External and Internal. The overall response for each ability is given in the next table No. 3.

## TABLE NO. 3

Total Number of respondents - 74

| | | External | Internal |
|---|---|---|---|
| 1. | Knowledge | 62.5%* | 61.3% |
| 2. | Comprehension | 58.1% | 63.6% |
| 3. | Application | 53.1% | 57.1% |
| 4. | Analysis | 42.1% | 42.5% |
| 5. | Synthesis | 37.5% | 25.6% |
| 6. | Evaluation | 46.1% | 41.1% |
| 7. | Drawing Skills | 24.3% | 28.3% |
| 8. | Handling Skills | 21.0% | 37.6% |
| 9. | Communication Skills | 40.1% | 40.6% |
| 10. | Social Skills | | |
| | a) Team work | 22.6% | 39.6% |
| | b) Leadership | 9.0% | 42.0% |
| 11. | Personal | | |
| | a) Regularity | 34.1% | 66.3% |
| | b) Hardwork | 30.0% | 67.0% |
| | c) Inventiveness | 19.6% | 39.5% |
| | d) Originality | 37.3% | 63.0% |
| | e) Initiative | 27.0% | 56.0% |
| 12. | Interest | 37.0% | 62.6% |
| 13. | Positive and Scientific attitude | 28.1% | 41.6% |
| 14. | Appreciation | 25.0% | 49.3% |
| 15. | Creativity | 34.5% | 50.0% |

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* The percentage of external and internal when added exceeds 100 because some of the teachers have agreed that particular ability to be tested both by External and Internal. From the values, it is clear that in all the individual abilities except synthesis and evaluation the percentage of internal evaluation is greater than that of external. Hence, at this stage, in the design, outcomes of learning to be internally evaluated are decided.

TABLE NO. 4

| 4.5 | Experience | 1<br>0 yr. | 2<br>1 - 5 yrs. | 3<br>6 - 10 yrs | 4<br>11-15yrs | 5<br>16-20yrs | 6<br>21 & above | 7<br>Overall response* |
|---|---|---|---|---|---|---|---|---|
| 1. | Quiz announced | 15.5 | 3.0 | 11.8 | 8.9 | 5.7 | 3.6 | 8.1 |
| 2. | Quiz unannounced | 9.5 | 4.0 | 6.2 | 7.2 | 8.7 | 2.8 | 6.4 |
| 3. | Short duration objective type tests. | 15.5 | 10.0 | 9.6 | 10.3 | 7.8 | 12.1 | 10.9 |
| 4. | Short answer essay/ problem solving | 9.5 | 10.5 | 11.9 | 12.2 | 6.6 | 13.6 | 10.7 |
| 5. | Long answer essay | 16.0 | 9.0 | 13.6 | 20.2 | 5.6 | 8.6 | 12.2 |
| 6. | Class assignments/ tutorials | 10.0 | 9.0 | 6.3 | 7.7 | 7.0 | 6.4 | 7.7 |
| 7. | Home assignments | 8.0 | 7.0 | 5.6 | 4.8 | 5.0 | 5.7 | 5.8 |
| 8. | Guided individual project | 1.5 | 4.0 | 4.8 | 2.3 | 3.5 | 1.4 | 2.9 |
| 9. | Guided group project | 1.0 | 5.0 | 4.3 | 0.7 | 2.6 | 0.7 | 2.9 |
| 10. | Lab. /Field/Practical work | 2.3 | 6.0 | 3.9 | 7.7 | 5.6 | 7.8 | 5.6 |
| 11. | Observation | 3.5 | 3.5 | 1.9 | 2.7 | 0.3 | 2.1 | 2.3 |
| 12. | Checklists | 2.5 | 0.3 | 0.4 | 0.7 | 0.3 | - | 0.7 |
| 13. | Rating scales: interest | - | 0.7 | 0.4 | 0.7 | 0.9 | 0.7 | 0.5 |
| 14. | Rating scales: attitude | - | 0.4 | 0.4 | 1.6 | 0.9 | 0.7 | 0.6 |
| 15. | Group discussion | 5.5 | 7.0 | 3.6 | 3.8 | 4.7 | 1.8 | 4.4 |
| 16. | Seminar | 6.5 | 8.5 | 5.7 | 4.5 | 6.0 | 2.0 | 5.5 |
| 17. | Thesis/Dissertation | 4.0 | 2.5 | 3.9 | 3.7 | 6.6 | 1.1 | 3.6 |

* Here, the sum total is not equal to 100 because the respondents here not made their individual total to 100 as instructed in the questionnaire.

4.4 In this a checklist of outcomes of learning (as in 4.3) is given and the individual teacher is to respond in the two boxes provided by putting ticks and crosses. The first box relates to the end university examination obtaining now in their subject at this point in time. The second box relates to what he would like to assess continuously, periodically, internally by adopting several techniques.

A summary of all their responses in respect of any one of the categories of teaching experience will give us an idea of (1) what abilities, according to them, the present university examination in their subject does assess, and (2) what abilities/skills/attitudes etc. they would like to continuously and internally assess. This is a very important step and decisions made by individual teachers are studied and consolidated and a consensus worked out. (Table No. 2 & 3).

4.5 Perhaps this is the most important step. This involves every individual teacher to select component tools of the semester system from a list of 17 tools presented in order to evaluate the abilities listed in 4.4. In the first box, he puts in a tick to indicate that he will adopt this component tool. In the second, he has to indicate the relative weightage to the components in respect of a certain number of components selected by him. One way to get this easily sorted out is to get the individual teacher to distribute 100 marks to all these components selected already. Here again, the group's solution can be worked out in respect of every one of the 17 components. Please see table No. 4. It was found necessary to regroup them into six major components which are in tune with the present thinking of the teaching community in the country. These six major components are as follows.

| | Major Components | Weightage in Percentage given by the respondents (teachers): |
|---|---|---|
| I | Quiz (announced, unannounced) | 16.0% |
| II | Written tests (objective, S.A. L.A., P.S.) | 37.5% |

| | | |
|---|---|---|
| III | Assignments/Tutorials (class, home, library etc.) | 15.0% |
| IV | Lab./field/practical work, observation | 14.5% |
| V | Personality traits (checklist interest, attitude scale) | 2.0% |
| VI | Group discussion/Seminar or/ thesis/dissertation. | 15.0% |
| | | 100.0% |

From this analysis, it is clear that the second major component, namely written tests has been given more weightage of 37.5% and the others four major components namely I, III, IV and VI have been given equal weightages of about 15%. But among the written tests, if we see the table No. 4 Column No. 7 we find that the teachers have given more weightage to long answer question testing which is the important tool of the traditional system. Objective type testing has been given the second place and the short answer the third place. This is not correct. If this type of testing is followed then the semester system will not be fruitful. The remedy is that the objective type of testing should be given the first place followed by short answer/problem solving and then long answer. An ideal model of the Question paper should contain all the three in the following order:

Number of objective type test items = 40

Short Answer Questions = 17

Long Answer Questions = 3

| | | | |
|---|---|---|---|
| Part A | 40 items | 40 marks | 40 minutes |
| Part B | 17 Questions | 40 marks | 95 minutes |
| Part C | 3 Questions | 20 marks | 45 minutes |

Part A is made up of objective type test items and given first to students. They may respond on the question book itself or a separate response sheet be prepared and given. After the completion of Part A, Part B and C will be given for answering. It is also possible that teachers can use the banks of questions/items for making up class tests much on the same lines as outlined above for university examinations.

4.6 This is an individual assessment format for the first four major components mentioned above and the individual teacher is asked to react to the following. 1) the number of assessment proposed for a semester or a year in the subject. 2) class size 3) duration in minutes 4) mode of conducting i. e. whether extra preparation for that particular assessment is required or not.

This really means that the individual teacher makes a decision about implementing the assessment tools as a component part of internal assessment. It is possible to look at the responses given by individual teachers with different number of years of teaching experience and suggest a consensus based on all their responses to 4.6 This is shown in the table No. 5. in the succeeding page.

5.1 - 5.4

This deals with the syllabus analysis. One can analyse any syllabus to obtain its limit in clarity by subjecting it to the following basic questions. Does the syllabus indicate answers to any of the following? What, Why and How should a teacher teach and How does the teacher know what he has taught? These basic questions have been expanded with specific items of enquiry to bring in a reasonable quantum of objectivity in the analysis, and then it is possible to quantify the clarity of a syllabus by a suitable analysis, proforma given. 'How clearly the syllabus provides guidance' can be determined by the teacher by answering the questions listed in it. A 5 point grade scale is given and the teacher is expected to put a tick on the slanting line-provided for the purpose. Table No. 6 gives the analysis of the question No. 5.1 to 5.4.

## TABLE NO. 5

| Experience<br>Tools of Evaluation | 0 yr. | | | | 1 - 5 yrs | | | | 6 - 10 yrs. | | | | 11 - 15 yrs | | | | 16 - 20 yrs. | | | | 21 & above | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| 1. Quiz announced | 1.2 | 18 | 60 | - | 1.7 | 21.9 | 51 | 18 | 3.0 | 19 | 64 | 9 | 1.0 | 18 | 19 | 15 | 2.1 | 12 | 42 | - | 2.7 | 17 | 71 | - |
| 2. Quiz unannounced | 1.0 | 4 | 40 | - | 2.5 | 20.5 | 50 | 15 | 2.6 | 15 | 64 | 9 | 1.4 | 15 | 38 | 24 | 2.1 | 13 | 42 | - | 1.2 | 9 | 42 | - |
| 3. Short Duration Objective Type | 2.6 | 12 | 40 | 20 | 3.3 | 42 | 62 | 22 | 4.5 | 17 | 45 | 27 | 3.5 | 27 | 78 | 17 | 5.3 | 15 | 47 | 33 | 3.4 | 44 | 85 | - |
| 4. Short Answer/ problem solving type | 3.0 | 14 | - | 40 | 2.8 | 29 | 55 | 29 | 2.7 | 25 | 27 | 45 | 2.9 | 33 | 62 | 17 | 1.4 | 13 | 63 | 33 | 2.3 | 54 | 100 | - |
| 5. Long answer essay | 2.0 | 16 | - | 40 | 2.9 | 40 | 48 | 23 | 3.0 | 25 | 18 | 55 | 2.7 | 45 | 54 | 24 | 1.0 | 33 | 62 | 33 | 2.3 | 71 | 85 | 15 |
| 6. Class assignments/ tutorial | 6.0 | 19 | 46 | - | 4.6 | 35 | 45 | 25 | 5.2 | 25 | 45 | 27 | 3.5 | 29 | 54 | 24 | 3.0 | 20 | 42 | 33 | 4.8 | 76 | 57 | 14 |
| 7. home assignments | 3.0 | 36 | 40 | - | 4.9 | - | 48 | 25 | 9.0 | 23 | 36 | 27 | 5.2 | 37 | 71 | - | 2.4 | 20 | 50 | 33 | 4.8 | 120 | 42 | 14 |
| 8. Guided individual Project | 0.2 | 1wk | 20 | - | 0.9 | 68 | 45 | 5 | 1.2 | 36 | 45 | - | 2.0 | 25 | 30 | - | 0.5 | 33 | 45 | - | 1.2 | 90 | 28 | - |
| 9. Guided group project | - | - | - | - | 0.7 | 65 | 45 | 5 | 1.0 | 24 | 36 | 9 | 0.9 | 5 | 14 | 16 | 0.5 | 10 | 35 | - | 1.4 | 47 | 28 | - |
| 10. Lab./Field/P. work/Observations | 2.0 | 120 | 40 | - | 14.1 | 42 | 42 | 23 | 2.8 | 35 | 18 | 27 | 5.2 | 59 | 28 | 24 | 3.8 | 40 | 42 | - | 5.0 | - | 42 | 14 |

1. Average number of assessment proposed in a semester
2. Its duration in minutes
3. Percentage of those who require extra preparation for these assessments
4. Percentage of those who do not require extra preparation

## TABLE NO.6

## SYLLABUS ANALYSIS

| S. No. | List of question | No. Exp. | 0-5 | 6 - 10 | 11 - 15 | Based on all respondents |
|---|---|---|---|---|---|---|
| 5.1 | What should the teacher teach? | | | | | |
| | a. All Subject matter | 2.2 | 2.4 | 3.2 | 1.6 | 2.4 |
| | b. Activity of student | 1.7 | 1.5 | 1 | 1 | 1.4 |
| | c. Link with other subjects | 1.0 | 1.1 | 1 | 1.6 | 1.2 |
| | d. Depth of Treatment | 2.2 | 1.7 | 1.5 | 1.3 | 1.7 |
| 5.2 | Why should the teacher Teach? | | | | | |
| | a. Industrial, life examples given. | 2.5 | 1.6 | 1 | 1 | 1.5 |
| | b. Student's skills, abilities to be developed | 2.2 | 1.6 | 1 | 1 | 1.5 |
| | c. Students' knowledge be developed | 2.5 | 2.4 | 1.7 | 3 | 2.4 |
| | d. Students' social skills to be developed | 1.5 | 1.3 | 1.2 | 1.3 | 1.3 |
| 5.3 | How should be teacher teach? | | | | | |
| | a. Method of teaching | 1.2 | 1.5 | 1 | 1 | 1.2 |
| | b. Teaching learning aids | 2.0 | 1.5 | 1.7 | 1 | 1.6 |
| | c. Time allocation | 2.0 | 2.7 | 5 | 2.6 | 3.1 |
| | d. Class room organisation | 1.0 | 1.5 | 1 | 1 | 1.2 |
| | e. Lesson plans | 1.0 | 1.4 | 1 | 1 | 1.2 |
| | f. Method of Evaluation | 1.25 | 1.7 | 1.25 | 1 | 1.4 |
| 5.4 | How does the teacher know that he has taught? | | | | | |
| | Class room | | | | | |
| | a. Type of test | 2.2 | 1.8 | 1.2 | 1.3 | 1.7 |
| | b. Frequency of test | 3.0 | 1.3 | 1.7 | 1.3 | 1.7 |
| | Laboratory | | | | | |
| | a. Type of test | 2.0 | 3.0 | 1 | 0.33 | 1.8 |
| | b. Frequency | 1.7 | 2.1 | 1 | 0.33 | 1.5 |
| | Syllabus indicates students | | | | | |
| | a. Academic abilities | 2.0 | 1.4 | 1 | 1.3 | 2.0 |
| | b. Psychomotor skills to be tested | 1.5 | 1.1 | 1 | 1.0 | 1.5 |

Table showing the averageof points given by the respondents for the syllabus analysis proforma of question No. 5.1 to 5.4.

As per the table, for the Question No. 5.1 which reads 'what should the teacher teach'? the order of preference is all subject matter, activity of students, depth of treatment and finally link with other subjects. So, here, the teacher is expected not to teach syllabus matter alone but all subject matter. For the question No:5.2 which reads" why should the teacher teach"? the answer is first to develop students' knowledge then their skills, abilities followed by industrial/ life examples given and finally to develop students' social skills. For the question No. 5.3 which reads, 'How should the teacher teach"?, the answer is firstly by lesson plans followed by method of teaching and evaluation, teaching/ learning aids, class room organisation and finally time allocation. It is very important to note that time allocation method of teaching has got the last place.

For the question No. 5.4 which reads "How does the teacher know that he has taught?", the answer for class room teaching is by the type of test conducted by the teacher followed by the frequency of test, the answer for the laboratory teaching is also by the type of test conducted by the teacher followed by the frequency of test. This clearly shows that the frequency of the test has got only secondary importance whereas the teacher knows what he has taught by conducting different types of tests such as Quizzes, Short Answer, Long Answer, etc. The respondents have also given the view that syllabus indicates the academic abilities rather than the psycho-motor skills to be tested.

Questions 5.5 - 5.22

These are a series of questions in the three point scale revealing the deficiencies of a traditional annual system of syllabus and suggestions for their rectification. This is similar to the three point scale of question No. 3.1 to 3.14. Here also the analysis is being done by taking the percentages of those who have agreed, disagreed or felt uncertain to the given statement. The first 9 questions from 5.5 to 5.13 reveal the deficiencies of a traditional system and the percentages of those who have agreed, disagreed or felt uncertain alone are given & the other 8 questions from 5.15 to 5.22 reveal the suggestions for their rectification. They are explained below:

5.5 Production process by which the syllabus originates is too segmental, mostly casual and frequently ad-hoc. 80% have agreed, 10% have disagreed and 10% have felt uncertain about it. This applicable.

5.6 Lack of emphasis on priorities and time allocations. 79% have agreed 17% have disagreed and only 4% have felt uncertain. This is also applicable.

5.7 Constraint in teaching order 75% have agreed 17% disagreed & 8% have felt uncertain about it. This is also applicable.

5.8 No integration of different subjects of study. 64% have agreed, 30% have disagreed and only 6% have felt uncertain. This is also applicable.

5.9 All the above four lead to narrow compartmentalisation and disjointed presentation. 69% have agreed, 17% have disagreed and 14% have felt uncertain. This is also applicable.

5.10 The syllabus does not indicate the abilities and skills. In the absence of this, examinations are normally used to define the abilities and from this, emerges very often a single ability 'to remember specifics' 83% have agreed this, 10% have disagreed and 7% have felt uncertain. This is also applicable

5.11 As there is no identification of abilities to be developed in the students, there is no link between teaching method and syllabus. As a result, most of the teaching strategies degenerate into a stereotype lecture with teacher domination. 80% have agreed, 16% have disagreed and only 4% have felt uncertain. This is also applicable.

5.12 The inadequacies of this type of syllabus-examination approach to our system of education will lead to the deterioration of the quality of the students coming out of the system with the consequent under-employment or unemployment of them. 87% have agreed 8% have disagreed and 5% have felt uncertain This is also applicable.

5.13 The "Syllabus Examination" approach is to be replaced by an approach based on the development of needed abilities through appropriate learning experiences, content or subject matter. In such an approach will then appear a frame work in which the desired abilities may be developed. 89% have agreed, 8% have disagreed and only 3% have felt uncertain about it. This is also applicable.

5.15 Syllabus has to be framed by the teachers who are "professional" and those who are trained in the science of syllabus preparation. 91% have agreed, 9% have disagreed and none of them have felt uncertain. This is highly applicable.

5.16 Some view that there must be a frequency in up-dating the syllabus. In your subject, according to you, which would you like? i) Change every year ii) Change once in two years. iii) Change whenever needed. For this question, only 4% of the teachers have agreed that there should be a change of syllabus every year, 18% have favoured for the change once in two years and majority of 78% of them have suggested that there should be change of syllabus whenever needed. This is also applicable.

5.17 Every time the syllabus is changed, there must be an addition of new topics and a deletion of out-dated topics. 90% have agreed, 8% have disagreed and only 2% have felt uncertain. This is also highly applicable.

5.18 The new addition to the syllabus should be the up-to-date advancements in the subjects concerned. 100% of the teachers have agreed on this. So this is very much applicable.

5.19 Syllabus has to be framed on content topics only. 61% have agreed 34% have disagreed and only 5% have felt uncertain. Though the % of teachers who have disagreed is greater here, majority of them have agreed on this. Hence this is also applicable.

5.20 In the conversion of the traditional annual syllabus into a semester system of syllabus, the former can be broken exactly into two similar portions to get the syllabus for two semesters and the I portion is kept for I semester and the II one for the II semester. 65% have agreed, 20% have disagreed and 15% have felt uncertain about it. This is also applicable.

5.21 By doing the method mentioned in 5.20, continuity in the subjects will be there and in the examination for the second half of the 2nd semester course, a student is not expected to have forgotton the first half, and questions asked for integration of the two are not considered out of order. 72% have agreed 16% have disagreed 12% have felt uncertain.

5.22 In the semester system of teaching, the contents and abilities to be developed in students are the two important factors. So, the preliminary areas included in earlier semester must be introductory in character, (abilities like knowlege, comprehension etc.) with the simpler contents and the syllabuses for later semesters deal with higher order abilities like application, analysis, synthesis and evaluation with some complicated contents. 94% have agreed 6% have disagreed and none of them have felt uncertain about it. Hence, this statement is highly applicable.

Even an existing syllabus can be qualitatively improved by the methods from 5.15 to 5.22 suggested above if one can identify major ability classes to be developed in each of the major topic of the syllabus and accord judicious weightages to these abilities.

A new dimension, one of the important missing elements of the traditional syllabus of even rationally identifying the abilities and skills, can thus be added. This additional dimension of abilities and skills enables the teachers and examiners to orient their respective functions more rationally and logically than is possible with a traditional syllabus.

5.14 In this Question, a list of abilities/skills involved in 'learning' subjects at graduate level is given. This is a two point scale question there are two boxes. A teacher is asked to put a tick in the first box if the item exists in his area and among the selected items, he is asked to give a rank order in the second box. The following table shows the rank order given by the teachers:

| S. No. | List of items | Points given | Rank order |
|---|---|---|---|
| 1. | Ability to identify the relationship in different situations. | 3.30 | 16 |
| 2. | Ability to reproduce verbally laws and principles | 2.60 | 8 |
| 3. | Ability to work to given instructions | 2.20 | 3 |
| 4. | Ability to recall factual knowledge | 2.70 | 10 |
| 5. | Knowledge of ways of using apparatus | 2.35 | 4 |
| 6. | Knowledge of history of Science and Technology | 2.05 | 2 |
| 7. | Ability to verbalise symbolic relationship | 2.45 | 6 |
| 8. | Ability to apply generalisations to new situations | 3.85 | 19 |
| 9. | Ability to use simple apparatus | 2.35 | 4 |
| 10. | Ability to speculate to exercise imagination in problem solving. | 3.30 | 16 |
| 11. | Ability to record appropriately the observed structure or system and the changes occuring in it. | 2.65 | 9 |
| 12. | Knowledge of definitions of Physical quantities | 3.00 | 14 |
| 13. | Ability to predict on the basis of given data | 2.85 | 12 |
| 14. | Ability to recognise problems that lend themselves to scientific treatment | 3.00 | 14 |

| | | | |
|---|---|---|---|
| 15. | Ability to draw conclusions | 4.00 | 21 |
| 16. | Ability to devise novel procedures to solve a practical problem | 2.75 | 11 |
| 17. | Knowledge of relationships between laws and specific phenomena | 3.00 | 14 |
| 18. | Knowledge of Technical terms | 3.95 | 20 |
| 19. | Ability to plan experiments and test hypothesis | 2.50 | 7 |
| 20 | Ability to pursue experimental enquiry | 2.00 | 1 |
| 21. | Knowledge of specific facts | 4.40 | 22 |
| 22. | Knowledge of general principles | 4.65 | 23 |
| 23. | Skills in drawing, deciphering and reading | 2.70 | 10 |
| 24. | Knowledge of conventions | 3.40 | 17 |
| 25. | Ability to give specific examples of scientific principles. | 3.15 | 16 |
| 26. | Ability to use measuring instruments to stipulated accuracy | 2.95 | 13 |
| 27. | Ability to select, evaluate and apply information in relation to problems | 3.45 | 18 |
| 28. | Ability to make inferences from data presented in graphic form | 3.10 | 15 |
| 29. | Ability to distinugish between observational and experimental facts on the one hand and explanatory theories on the other | 2.40 | 5 |
| 30. | Ability to verify facts already taught. | 4.80 | 24 |
| 31. | Ability to express clearly, specifically in written, spoken form | 5.15 | 25 |
| 32. | Ability to work as a member of | | |

| | | |
|---|---|---|
| a team in discussion, group work, lab./practical work | 5.80 | 26 |

6.0 Teaching-learning activities: The different activities listed in this section are not necessarily mutually exclusive or isolated; they may be undertaken one at a time or in combination as appropriate. There are about 14 questions regarding teaching - learning activities given. After each question, there are two boxes. The teacher is asked to put a tick in the first box if he considers it necessary for the semester system of teaching and in the second box he is asked to write the weightage he would give for them. The following table shows the weightage in percentage given for each method of teaching and learning by the respondent teacher.

| Q. No. | Questions | Weightage given |
|---|---|---|
| 6.1 | Lecture | |
| | a) formal style, controlled language logical structure | 13.00% |
| | b) informal style, conversational language, inductive approach | 19.30% |
| | c) conversational (dialogue) style frequent questions and answers | 27.75% |
| 6.2 | Class discussion | |
| | a) formal, controlled by the teacher, through questions and answers with teacher-students interaction | 18.50% |
| | b) informal, permissive atmosphere, voluntary participation under guidance, teacher-student and student-student interactions | 19.75% |

| | | | |
|---|---|---|---|
| | c) | short structured, purposeful, pinpointed 'buzz sessions' with small groups (on some specific question) followed by reporting to the whole class. | 11.5 % |
| | d) | purposeful, structured group discussion (followed by reporting to the whole class and general discussion). | 11.0 % |
| | e) | group work (discussion and experimental or productive effort). | 11.1 % |
| 6.3 | Team Teaching | | |
| | a) | shared/divided teaching(with or without interaction between the members). | 11.5 % |
| | b) | symposium type (different members presenting/discussing different aspects) | 14.5 % |
| | c) | panel discussion type (with members supplementing and interacting and also discussing with the class) | 15.85% |
| | d) | a major presentation to a large group followed by group discussion; (each group with a teacher may first adopt an inter disciplinary approach where applicable followed by discussion on specialities) | 18.55% |
| 6.4 | Tutorial/discussions | | |
| | a) | with individual students | 17.15% |
| | b) | with small group | 27.10% |
| 6.5 | Recitations.(Recitations from memory, or reading or repetition of presented material) | | |
| | a) | Individual | 20.45% |
| | b) | group (shared or in chorus) | 6.95% |

6.6 Projects (Studies, expt.s, production, or any other purposeful and planned activity

| | | |
|---|---|---|
| a) | Guided individual projects | 12.55% |
| b) | Guided group projects | 18.20% |
| c) | Independent individual projects | 13.50% |
| d) | Independent group projects | 9.90% |

6.7 Experiments

| | | |
|---|---|---|
| a) | Instructed/guided, supervised | 20.20% |
| b) | Guided but not supervised | 9.65% |
| c) | Independently planned and conducted (before learning related theory or after learning them but without specific instructions on procedure. | 11.40% |

6.8 Supervised/independent study

| | | |
|---|---|---|
| a) | guided and supervised study | 20.95% |
| b) | guided and not supervised study | 12.25% |
| c) | Independent study (or specific assignments) | 16.45% |
| d) | Independent study (without assignments and on one's own choice) | 7.85% |

6.9 Use of structured/programmed instructional learning material

| | | |
|---|---|---|
| a) | Well structured lessons/material (logically presented in text book style) | 10.80% |
| b) | Material in informal conversational style | 8.60% |
| c) | Material in dialogue form | 7.45% |
| d) | Programming consisting of short presentations followed by response items of each. | 8.30% |

| | | |
|---|---|---|
| e) | Step wise (frame by frame) programming with response and feed back at each step) | 16.65% |

## 6.10 Assignments

| | | |
|---|---|---|
| a) | Theoretical - essay, etc. (individual) | 17.50% |
| b) | Theoretical-essay, etc. (group) | 6.95% |
| c) | Practical-expts; collection, planning etc. (individual) | 10.6 % |
| d) | Practical-expt. s, collection, planning etc. (group) | 3.6 % |
| e) | Problem solving exercises | 19.55% |

## 6.11 Students Seminars

| | | |
|---|---|---|
| a) | Preparation and presentation of papers | 18.67% |
| b) | Leadin , discussions (and answering question) | 17.40% |
| c) | Symposia | 8.75% |
| d) | Panel discussion | 7.85% |

## 6.12 Workshop method

| | |
|---|---|
| (Combining theoretical presentations/discussion by teachers, use of appropriate aids, group discussion and work productive effort, group presentations and general discussion, review etc.) | 14.95% |

## 6.13 Manipulative exercise/performance experience

| | | |
|---|---|---|
| a) | examination/observation of specimen, models, etc. with or without tools. | 15.18% |
| b) | limited participations in process | 3.15% |
| c) | exercise/process experience with | |

| Q. No. | | Question | Weightage given |
|---|---|---|---|
| | | increasing responsibility (including laboratory experiments and workshop practice - under gradually diminishing guidance. | 8.85% |
| 6.14 | | Audio-visual methods | |
| | a) | Demonstration of processes/ experiments | 8.63% |
| | b) | Use of visual aids (graphic projected, three dimensional) | 10.80% |
| | c) | Use of appropriate aids (records etc.) | 9.65% |
| | d) | Use of appropriate audio-visual aids (film, T.V., etc.) | 8.90% |
| | e) | Use of learning laboratories | 9.95% |
| | f) | Field trips (visits, excursions, etc. geared to specific instructional purposes/learning). | 15.90% |

7.0 This is the same as 6.0, and the questions asked are all on methods of Evaluation. Under each method, few questions have been asked and the teacher must put a tick in the first box if he considers it necessary for the semester system of evaluation and in the second box he has to write the weightage he would give for them. The following table shows the weightage in percentage given for each method of evaluation by the teacher.

| Q. No. | | Question | Weightage given |
|---|---|---|---|
| 7.1 | | Oral tests | |
| | a) | Quiz (random or structured) | 17.30% |
| | b) | Viva-voce (covering a balanced sample objectives/content) | 21.18% |
| | c) | Viva-voce (with sequential and | |

| | | |
|---|---|---|
| | consequential questions for deep probings) | 14.03% |

### 7.2 Written/paper-pencil tests

| | | |
|---|---|---|
| a) | Essay/long answer type questions. | 17.25% |
| b) | Short essay type question (limited length with considerable specificity of content) | 18.25% |
| c) | Short answer type question (with high specificity of content) | 19.75% |
| d) | Objective types of items | |
| i) | multiple choice | 11.65% |
| ii) | matching | 9.30% |
| iii) | true-false (with or without correction) | 8.75% |
| iv) | multiple facet | 5.85% |
| v) | rearrangement | 7.10% |
| vi) | drawing and or labelling type | 5.50% |
| vii) | modified/combined types (including mastermatching, cluster true false etc.) | 3.75% |
| viii) | marking (in given material) | 5.45% |

### 7.3 Performance test (practical examinations)

| | | |
|---|---|---|
| a) | assessment of process (techniques and skills) | 14.70% |
| b) | assessment of product | 9.95% |
| c) | speech tests, etc. | 11.95% |

### 7.4 Observational Techniques (direct and indirect)

| | | |
|---|---|---|
| a) | Rating scales | 8.95% |
| b) | Anecdotal records | 4.65% |

| | | | |
|---|---|---|---|
| | c) | Sociometric techniques (sociogram, social-distance scales, etc.) | 2.65% |
| | d) | Observation schedule (for performance) | 3.75% |
| 7.5 | | Questionnaire | |
| | a) | Closed end form | 8.85% |
| | b) | Open end form | 13.75% |
| 7.6 | | Inventories and attitude scales | 6.40% |
| 7.7 | | Checklist (self/reporting from memory/ or observation) | 10.95% |
| 7.8 | | Interviews | |
| | a) | Fact collection | 7.95% |
| | b) | Guidance/counselling | 9.20% |
| 7.9 | | Project techniques<br>(word reactions, sentence completions, picture reactions etc.) | 4.35% |
| 7.10 | | Situational tests (coupled unit observations) | 5.55% |
| 7.11 | | Student self reporting (in appropriate forms) | 12.25% |
| 7.12 | | Examination of student work products (assignments of different kinds - including term paper, project report dissertation, etc.) | 15.65% |
| 7.13 | | Observation and rating of participations in seminars, discussion, etc. | 17.35% |

## SECTION SIX

# SEMESTER - ITS IMPLICATIONS ON SYLLABUSES, TEACHING AND LEARNING

# SEMESTER - ITS IMPLICATION FOR SYLLABUS, TEACHING/ LEARNING AND EVALUATION

## I SYLLABUS:

The three elements that are easily identified in the realm of existing education system are (i) syllabus, (ii) teachers-students facilities (iii) examination. Administrators, teachers and examiners depend completely on the syllabus document for their respective functions of specifying, recognizing and awarding, teaching and examining. It may sound strange, but the fact remains that the process of producing such a document is being given superficial consideration. This process has been too segmental, mostly casual and often ad hoc. With this kind of casual approach to one of the dominating elements, the casualities are the teaching performance of the teachers and the learning attainment of students.

Syllabus, therefore, is the dominating element in this system. What is a syllabus? We know that a syllabus is a document which contains (i) a number of names of major topics, (ii) secondary topics for each major topic, (iii) sometimes, time allotted for coverage of the syllabus. While preparing a detailed syllabus for each course of study, it is desirable to include statements of (a) objectives and scope of the course, (b) content outline in terms of units and topics, (c) suggestion for teaching— learning methods and activities (d) suggestions on evaluation, techniques and tools to be used and (e) essential books and supplementary reading lists. Apart from this, the syllabus should also specify the content areas fully and clearly and indicate the intellectual abilities and skills to be developed by students. They could be designed in such a way as to make it convenient to suitably modify or enrich the course within the framework prescribed in the syllabus with a view to continuously improving and updating the syllabus (without going through the formalities for change in syllabus). A semester system syllabus for the subjects Mathematics & Engineering Science at the U.G. Level has been given in the appendix.

But, in fact, the syllabus as it obtains now is extremely inadequate. So it is necessary to analyse the syllabus to obtain its limit in clarity by subjecting it to the following basic questions. Does the syllabus indicate answers to any of the questions like What, Why and How should a teacher teach and How does the teacher know what he has taught? These basic questions can be expanded with specific items of enquiry to bring in a reasonable quantum of objectivity in the analysis; and it is possible to quantify the clarity of syllabus by a suitable analysis proforma. How clearly the syllabus provides guidance can be determined by the teacher by answering the questions listed in that proforma.

The implications of syllabus (curriculum) in a rational and scientific semester system implementation is that the framing of the syllabus is not done by simply breaking the old traditional syllabus into two halves. The areas like content and ability have to be taken into consideration.

### In terms of content:

Content areas for the earlier semesters have to be of lower order involving information,and complex areas may be included for the later semesters.

### In terms of ability:

Similarly, the primary areas must deal with the simpler abilities like comprehension and knowledge while the later must deal with more complicated intellectual abilities like application, analysis, synthesis and evaluation. By and large, there must be a built in continuity in respect of both content and abilities.

## II TEACHING/LEARNING

Teaching is a complex and sophisticated science requiring not only the knowledge of a particular discipline but also the ability to analyse, synthesize, evaluate, communicate, demonstrate, show application, draw analogies and finally promote learning in the class rooms, laboratories and field. While few individuals possess this ability without the benefit of training, it has been proved beyond doubt that good teachers can be made and are being made out of training. Many would say that good teaching is recognized when it is present, but that it may not be possible to say with certainty what constitutes good teaching. However, modern educators feel that good teaching is that which ensures effective learning. The premium must therefore be on effective learning. An attempt is made in this section first to briefly review existing teaching methods, their deficiencies and inadequacies, and then to highlight the change in the role of a technical teacher in order that effective learning takes place. New approaches to teaching will be indicated in the fields of humanities and commerce subjects.

Present methods of teaching: There are about sixteen methods of Teaching/Learning. They are explained below:

## 1 - LECTURE

Most of the teaching done in colleges, and university departments is in the traditional teacher-centred approach in which questions like:

What is to be taught?

When is it to be taught?

Why is it to be taught?

How is it to be taught?

are asked and answered. This approach is dominated by the teacher and is carried out in the following operations:

a) teacher preparation is largely based on text-books, reference books, journals, research papers, industrial experience, past examination papers, etc.

b) teacher presentation is usually in the form of lecturing to large groups, and for its effectiveness depends on the experience of the teacher and his ability to communicate.

c) student reception is through listening and is effective fo fast learners only. A class of 100 contains approximately 20 fast learners.

In this system, students learn 13% by listening whereas the bulk of students' learning (almost 70%) results from seeing and doing. There is in addition the absence of feedback in the system in the sense that the teacher does not know whether his students have really learnt.

## What Then Is a Lecture?

The Ministry of Labour's Glossary of Training Terms defines a lecture as "a straight talk or exposition possibly using visual or other aids but without group participation other than through questions at the conclusion."

The lecture method is used extensively in university teaching. It is often very difficult to prove its effectiveness. Any teaching method must not only be matched to the topic but also to the ability range of students and to external parameters such as time, accommodation and facilities. Even then ultimate success will depend on the technique of the lecturer, his personality, the rapport between him and his students, and his skill to demonstrate and use visual aids.

The lecture method can be used:

a) for large groups

b) to introduce or summarise topics covered in great details by some other method.

c) to develop basic principles

d) to provide an economic method for demonstrating and showing to large groups new techniques, expensive equipment and films.

e) to provide an intellectually stimulating experience.

The lecture must be matched with the ability level of students; the lesser the ability the more visual the presentation and the lesser the lecturing. The lecture method is nevertheless an "open loop" method of teaching, which does not take into account student reaction. It is first and foremost a teaching method and in the total Teaching-Learning process it must form only a part and never the whole of the process.

So in teaching methods, the traditional method i.e. lecturing, must be given secondary importance and more number of hours have to be allotted for assignment, tutorial, discussion and project, laboratory work, home study because intellectual abilities of a higher order like application, analysis, synthesis and evaluation and affective abilities like interest, motivation, attitudes, team-work are all developed only by these methods.

Attendance based classroom instruction can be replaced by a system called "credit system" which is basically one for simplifying what has been called "academic book keeping". A student earns his degree by accumulating a specified number of academic credits instead of attending for a specified number of years. The semester credit hour is defined as a unit for expressing quantitatively the content of a course at the level of higher education. The most widely accepted meaning of a credit is that a student earns one credit by attending one 50 minute period of lecture class instruction and doing 2 to 3 hours of home study each week throughout one semester. Thus the terms "credit" and "semester hours" are often used interchangeably. Credits do not always require a particular number of class periods. Since one hour of theory class is expected to be supplemented by 2 to 3 hours of home study it is considered equivalent to 3 hours of laboratory or practical work. Since a great deal more can be covered in an hour of reading than in an hour of speech, the lecturer does not expect to "cover the course" in his lecture and in fact the lectures often must contain only supplementary material not available in books.

## 2. LESSON

'A method of instruction in which the material to be presented is structured to ensure the participation of the learning group'.*

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* Ministry of Labour's Glossary of Training Terms.

- promotes efficient learning
- high degree of teacher ability
- participation is achieved by question-answer technique providing feedback
- continuous monitoring of student learning is done by
    - i) question - answer
    - ii) short objective type test items
    - iii) short answer essay type questions
- incomplete or progressive handout (blank spaces to be filled in by students progressively - correct answers given to them periodically - reinforcement, correction and remedy).
- must be planned (Lesson plan consists of details of specific, instructional objectives, T/S activities, aids to Teaching/Learning, time scheduling testing or evaluation methods).
- involves a thorough understanding of communication channels available.
- involves use of audio-visual aids (pictures, charts, OHP transparancies, film strips, films, models-static as well as dynamic)
- enables basic psychological principles of learning to be built in:

    Organise subject matter
    Organise intellectual abilities
    Organise student activities (guide, provide for practice)
    Evaluate
    Motivate

- useful for learner behaviours of comprehension, application, evaluation, synthesis.

## 3. DISCUSSION

- may be free or led

- forms:
  - i) formal, controlled by the teacher through questions and answer (teacher-student interactions)
  - ii) informal, voluntary participation under guidance (teacher-student, student- student).
  - iii) short, structured, purposeful 'buzz sessions' with small groups (on the same specific questions) followed by reporting to the whole class.
  - iv) purposeful, structured group discussion (followed by reporting to the whole class and general discussion).
  - v) group discussion with points for discussion
- suited for development of learner behaviours (communication, attitudes, values, social skills, evaluation and synthesis).

## 4. TUTORIAL

forms:

- individual, group
- suited for development of application, evaluation, synthesis, expression, communication, interests, attitudes
- closed as well as open ended problem solving
- involving simple to complex tasks or abilities (in a problem solving situation involving new unfamiliar areas; it is possible to give hints/clues in the earlier tasks slowly withdrawing them in subsequent tasks/problems).
- mainly to diagnose, remedy learning
- also for routine problem solving skills

## 5. TEAM TEACHING

forms; a) shared/divided teaching (with or without interaction between the members)

b) symposium type - (different members presenting discussing different aspects)

c) panel discussion type (with members supplementing/interacting and also discussing with the class).

d) a major presentation to a large group followed by group work/discussion each group with a teacher (may first adopt an inter-disciplinary approach where applicable, followed by discussion on specialities).

## 6. DEMONSTRATING AND/OR EXPERIMENTING

- follow a set of direction or 'discovering'.
- teacher demonstrations help to coordinate theory with practice
- suited for development of laboratory/practical/workshop skills, communication, attitudes (scientific), personal and social skills, interest, appreciations
- live demonstrations using models, prototypes, recorded demonstrations
- experimentation both verification (practice after theoretical background) and investigation (practice before theoretical background).
- suited for skill learning by practice either in stages or as a whole
- examination/observation of specimens/models (with or without tools)

## 7. PROJECT

- (studies, experiments, production or any other purposeful and planned activity)
- forms a) guided individual projects (with a project brief giving details)
  b) guided group projects
  c) independent individual projects (thesis/dissertation)

- suited for development of cognitive, and affective skills - almost all the behavioural outcomes of learning are involved.

## 8. SUPERVISED/INDEPENDENT STUDY

- forms
  - a) guided and supervised study
  - b) guided but not supervised study
  - c) independent study (specific assignments)
  - d) independent study (one's own choice)
- development of good habits/skills of study, personal traits, values, higher order intellectual abilities.

## 9. USE OF STRUCTURED/SELF PACED/PROGRAMMED INSTRUCTION MATERIALS

- forms
  - 1) well structured (text book)
  - 2) unstructured (informal, conversational dialogue form)
  - 3) structuring - (Bibliography, P.I. materials)
  - 4) programming - (short presentations/responses to item)
  - 5) programming (frame by frame) with response and feedback at each step.

## 10. ASSIGNMENTS

- forms
  - 1) class (development of application, evaluation synthesis,abilities)
  - 2) home (development of copying,presentation)
  - 3) Laboratory (development of skills)
  - 4) field (development of research skills, communication, expression)

## 11. SEMINARS

- forms
  - 1) paper presentation seminar

  2) symposium type
  3) panel discussion

- suited for development of application, evaluation, synthesis, personal traits, interests, attitudes, values, communication, expression, social skills
- Controlled by teacher/expert.

## 12. CASE STUDY

- useful to examine a real or contrived event or problem and diagnose reasons which led up to it or propose remedies for solving it.
- useful for practice in solving 'human' problems and also for attitude development
- suited for development of research skills, inference ability

## 13. ROLE PLAYING

- act or play the role for which they are being trained (teachers, salesmen, interviewers)
- suited to build up personality traits, personal skills, attitude, values

## 14. SYNDICATE METHOD

- a problem situation is presented to a number of students in separate small groups, arrive at solutions. These are then presented to the whole group in a plenary session.
- suited to build up personality traits, social skills attitudes, values

## 15. BUSINESS GAMES

- Students play the roles of managers in a company the details of which they are given. The effects of their decisions are relayed back to them by a team of assessors and they take further action in the light of these effects

## 16. WORKSHOP METHOD

- combining theoretical presentation/discussion by teachers use of appropriate aids, group discussion and work, productive effect, group presentation and general discussion review, etc.).

## EVALUATION BY EXAMINATION

It is generally admitted that the present examination system needs reform. While the need for reforming examinations has been recognised, and much discussion has taken place, not much has been achieved so far to bring about improvements.

The most compelling reason for examination reform comes from academic considerations. It is not adequately recognised that examination is an aspect of the educational process which is intimately linked with its other important aspects - teaching, learning and examination actually constitute a trinity of functions. Teaching as well as learning are bound to be affected by a defective examination system, since both are dominated by the objectives that govern examinations. If examinations are, as at present mainly a test of memory and do not satisfactorily measure the critical power and intellectual development of students, it is not surprising if students and teachers do not approach their work in the right spirit. Learning will then tend to become a mechanical acquisition of a certain type of skills or information and teaching will become simply "coaching for examinations." It can at once be seen that the relation between examinations on the one hand and standards of teaching and learning on the other is intimate. Improvement in any one of these areas involves a corresponding improvement in the other areas also.

In other words, examination reform has to be approached not merely from the narrow angle of improvement of evaluation techniques but from the larger stand-point of making our educational system better able to perform its function of developing the students. This would mean that we have to deal not only with the processes and procedures associated with examinations but concern ourselves also with broader issues involved in making our universities centres of good education. The problem here is how examinations can be made an ally of good education. When we approach the examination system in this way we are led to consider its mechanics as well as such matters as proper selection of students for university courses, classification of the general and specific objectives of teaching, use of better methods of instruction, improvement of libraries, provision of residential facilities for students etc. ; which have a bearing on standards of education. It would be necessary, in other words, to reconsider the purposes of education and clarify the objectives to be aimed at. Out of this evaluation has emerged the recognition of the inter-relationship of educational process - teaching, learning and examining - and the possibility of making examinations a potent instrument of educational reform.

It is not sufficient to condemn the present system of examination in general terms. We need a more detailed analysis of the educational system and the conditions under which it actually operates. Improvements can only be made on the basis of knowledge.

Some steps have already been undertaken in a number of universities. While such studies are of great value, we need a continuous stream of applied research of high quality in many more centres to reveal the full range and implications of the problems we have to solve. We therefore feel that one of the most urgent needs in regard to examination reform relates to the study of features which contribute to the defects of the examination system. These may include enquiries regarding both the educational and technical aspects of examinations. The educational problems to be studied may include (a) different kinds of requirements for entrance to universities (b) aptitude tests for university courses (c) sociological factors influencing student performance (d) suitability of various types of examinations e.g. objective tests, open book tests, multiple choice answers, short-answer tests, etc. for evaluating student achievement, (e) teaching methods in relation to performance in examinations etc.

So, it has become clear that examinations are an aspect of the educational process which is intimately linked with its other important aspects - teaching, learning and examination actually constitute a unity of functions. Teaching as well as learning are bound to be affected by a defective examination system, since both are dominated by the objectives that govern examinations.

Once the question of improvement in examination pattern has come, we have to take into consideration the setting of question papers and pattern of question papers and evaluation methods. They are dealt with in detail in the following paragraphs.

Setting of Question Papers: Under the semester system, the number of tests or examinations is larger and it varies considerably depending on the teacher and the nature of the subject being taught. Almost universally a final examination is given at the end of the semester and counts for one fourth or less for the final grade. The last week of any term is given over to examinations. Tests or examinations given during the term may vary from one at the middle (called mid-term examination) to one every two weeks, one every week, and now and then a short quiz each day. More frequent examinations mean more work to set examination papers (although in the old system there used to be annual as well as supplementary examinations), to conduct the examinations and to compile the marks. Since setting of more question papers will take more time. question banks can be used for this purpose. For the use of teachers to make classroom tests (continuous assessment) a brochure type bank of items that are to be pretested may be preferred. As the items/questions which are found to satisfy the criterion of facility, discriminations, difficulty level, could be made into a bank of questions the examiners could use it in making "end of term" university examinations. In the case of the "end of term" semester examinations, it is preferred to have centralised paper setting and centralised evaluation scheme so that the results of the previous semester examinations are announced before the commencement of the next semester. One of the most important criteria which we have to look into during the centralised setting of question papers is the choice of questions in examinations.

The following questions raised by Dr. Bloom pertaining to the soundness of the present examination procedures in Indian Universities also deserves study:

1. What is the level of reliability of these examinations and by what techniques can it be improved?

2. What is the present level of errors attributable to subjectivity on the part of the examiner and by what technique can this error be reduced?

3. What are the soundest procedures for combining marks from internal and external assessments, if they have to be combined?

4. What is the relationship between the student's performances in various papers and how should the results be combined?

5. What is the relationship between the student's examination marks and the teacher's judgement of his competence?

6. What kind of examination questions do the students select to answer and what is the nature of the questions they avoid?

"A large body of teachers and educational administrators is not yet fully conscious of the subjectivity, unreliability and lack of validity of the examinations as conducted today." Talking of unreliability, we must clearly understand that the mark given by an examiner is something like a 'raw mark and it is certainly different from his 'true mark'. Such a raw mark is subject to an error which for some typical papers set at universities is greater than 5%. This means that when an examiner assigns a mark of 43 the true mark may be either above 48 or below 38 in 50 per cent of the cases. There are many sources of error that contribute to unreliability of our present day examinations. They are (a) Error due to subjectivity in marking, (b) Error due to biased sampling of topics, (c) Error due to biased sampling of abilities, (d) Error due to allowing students a choice of questions, (e)Error due to arbitrary time limits and (f) Error due to assumptions in addition of marks. If universities, examination boards in our country at all levels take steps to indicate along with raw marks of a student in each subject details like mean, standard deviation, reliability coefficient and error in measurement, there will then be no need for any treatment of scores.'

It is possible to look very closely at one of the sources of error in traditional essay type examinations: allowing students, a choice of questions. The presence of question choice in public university examinations of the traditional (essay) kind has been accepted and indeed upheld for many years at the university level. The reasons given for the need to allow this choice of questions are many: but two of the most important ones are: (1) it allows the teachers freedom to teach particular portions of the syllabus (in which they may be particularly interested) and (2) it allows students to concentrate on particular aspects of topics in which they are able to show themselves to the best advantage. This has led to the undesirable situation that teachers indulge in dealing with only a few topics in the syllabus leaving the rest for choice and on the other hand students increasingly indulge in ' 'selective cramming'. Both these have serious implications on teaching-learning, impairing its effectiveness, efficiency, relevance, adequacy and above all purpose. Question choice is still accepted today alongside the adoption of more rigorous methods of examining (e.g. the use of objective items) but little thought seems to have been given to the problems raised by allowing a choice of questions or even recognizing the fact that it may lead to complications. Some of these problems are presented here. Before presenting the problems, it is as well to remember the basic assumption that is made (albeit implicitly not explicitly) when using an examination where a choice of questions is presented. This assumption is that a candidate will be able to be compared with others taking the same examination whatever combination of questions he attempts in an examination paper. This implies a form of 'currency' (or comparability between individual questions) and hence combinations of questions. The viability and validity of this assumption will be explored now. In the context of semester examinations, this problem is much more relevant for consideration.

## The Problems and Their Effects

### THE SYLLABUS:

It may be asked whether or not syllabus topics (in their own right) are of the same basic level of difficulty. In general, it is unlikely that they are, but such an assumption one way or the other could be made only on the basis of a consensus of opinion. Let us consider a few examples. In undergraduate mathematics, a quoting of a principle in complex variable and an example by students and a factorization followed by the solution of a pair of simultaneous equations cannot be considered 'equal' in the basic level of difficulty. Here we are considering only the content and nothing else. In Geography again, is the description of industrial growth of an area on a par with naming rivers, hills and features on a map? We are now considering basic complex variable as opposed to solution of simultaneous equation and also a knowledge of industrial growth as opposed to the knowledge of a terrain. It is likely that no agreement can be reached regarding this problem. Apart from this, what is important is that as long as this difference of opinion in regard to the 'equality' of subject topics exists, the 'equality' of the results of candidates attempting these questions may be questioned.

## ABILITIES:

Let us look at these questions in terms of the 'abilities' they purport to test. Some of them may clearly involve memory and only memory. Yet others do involve 'comprehension' while some others deal with 'application' ability being put to test. How far are we justified to put on par a pair of questions that is definitely known to be testing different 'abilities'? Some questions will ask the students to translate information given in one form into another (from verbal to graph). Yet some other questions will involve calculations (after recalling a set of formulae, rules, procedures) and deduce conclusions there from. Granting that the questions test what they intend to test, then these questions in a paper will be testing different 'abilities', and we are not justified in permiting 'choice' in such questions. It is necessary, therefore, to group questions of the same category in terms of equality of ability tested and get students to respond to these. The restructured pattern[1] proposed by AIU (and accepted by many universities) involves in every paper:

Part A Objective type 20 to 40 items/20 to 40 mins/20 to 40 marks

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[1] Natarajan V., 'A Restructured Pattern of Exams. for Universities', University News, AIU, Delhi.

Part B Short answer type 10 to 15 questions/50 to 90 mins/ 40 to 60 marks.

Part C Long answer essay type 1 to 3 questions/20 to 60 mins/ 15 to 30 marks

Part A may have items (M/C, MF, etc.) all of them testing knowledge/ comprehension. Part B may have questions, all of them testing analysis/application and Part C may have questions all of them testing synthesis/evaluation. In this, it may be noted that there is no choice in Part A/Part B and there may be only internal choice in Part C. This pattern is all the more meaningful in Semester examinations.

## THE DIFFICULTY OF QUESTIONS:

It has been the practice to allow a choice of questions only in respect of supply type questions whether short answer or long answer. Where a restructured pattern is in practice, only Long Answer questions give a choice of questions for students. In respect of long answer questions, some of them are inherently more difficult than others. It is possible to work out a very realistic and accurate difficulty index (or Facility value) for every question in a choice type examination.

## VALIDITY:

In achievement examinations, we are principally concerned with content validity. It is easily appreciated that 10 questions or so will not be able to cover 100% of the syllabus. Very often the coverage will not exceed 80% of topics. In our traditional papers, the usual practice is to give 10 questions and ask students to answer 5 out of these. Immediately the validity is reduced to 40%. If we set pass mark in this paper as 35 out of 100, it really means that a person who has mastered just 0.35 x 40 = 14% of syllabus is declared passed. In contrast to this situation, we consider our restructured pattern.

| | | |
|---|---|---|
| Part A | 20 to 40 items | No choice |
| Part B | 10 to 15 questions | |

Part C 1 to 3 questions with
internal choice, if
any.

Here it can be seen that in the first place, the content validity of the paper is considerably increased say 90 to 95% and almost all questions are compulsory, Thereby, the validity remains more or less 90%. It is also the usual practice to increase the minimum marks for a pass to 40 or very often 50 in such a restructured paper. The overall validity for passing comes out to 45% as opposed to 14%.

## RELIABILITY

When we consider the reliability of a choice type examination compared to that of a no choice type, many things can be said. The overall reliability or the index of measurement efficiency is very high in a no choice type, since the number of items are more and the ratio of error variance to observed variance is very small. The internal consistency reliability of a no choice paper is also more than that of a corresponding choice type examination. However, it must be said that it is much more complicated to calculate reliability of a choice type compared to no choice type.

## UNIFORMITY

5 questions out of 10 can be chosen in $10_{C_5}$ =252 different ways. There is in fact 252 different combinations or different papers. Performances by students in this situation can never be compared. There is uniform injustice shown to all.

Some of the problems (and their effects) in allowing a choice of questions in examination papers have been presented here. At the same time it has been demonstrated that as far as all the problems are concerned, different rules will apply to different candidates since they all attempt different combinations of questions. The syllabus content, the ability, facility value are all bound to affect the marks of candidates; in the situation where choice is given depending on the combinations, these factors will have an unknown differential effect. It is this unknown effect working in a varying manner from one student to another that causes the greatest uncertainty in the results of a choice type examination.

From time to time certain ad hoc solutions have been suggested for this problem; The earliest one to be adopted was to have the paper divided into sections and choice allowed within sections. Another way was to have a question or two compulsory and a marginal choice (5 out of 7 or 4 out of 6) given. Another method tried was to keep certain questions starred and others free. Students were asked to attempt starred questions for at least 2/3rds maximum marks and the rest only from unstarred. All these 'ad hoc' solutions have a serious limitation. They have all involved traditional type (essay) and a fewer number of questions. A rational and scientific way is to restructure the examination as discussed early in this section. This alone would bring in improved validity, reliability, relevance and meaning into the process of evaluation of student performance. To implement this restructured pattern effectively, the chairmen, Boards of Studies in different subjects, together with their members should get the necessary orientation to enable them to take decisions on these patterns. However, it must be said that within the rigid frame-work there is flexibility. Rigidity is to be understood in terms of Part A - objective type, Part B - Short answer type and Part C - Long answer/problem solving being common for all subject areas. But flexibility is there for different Boards in the decision of the number of items, duration of parts and marks allotted to Parts. A pattern for different subjects at undergraduate and at post-graduate levels adopted in one university was sent to many universities to suggest modifications and the consensus arrived at published in the form of an article.

In a typical subject the pattern may be:

Part A : Objective type (Mostly M/C and M/F) 30 items for 30 minutes and 30 marks

Part B : 12 S.A. questions for 90 minutes and 50 marks

Part C : 2 L.A. questions for 60 minutes and 20 marks

In this pattern, the total number of questions to be answered by a student is 44. With 44 questions the content validity of the paper is very high. There is objectivity in marking Part A and Part B. There is, however, an element of subjectivity in Part C marking. At the same time, the overall reliability of the whole examination is very high. There is relevance; there is meaningfulness; there is purpose; above all, better validity and reliability. Moreover the Boards of studies accepting such pattern will have far reaching implication; it will influence the nature of question banking, the relative weightage of internal and external assessment and indeed the rationality of our evaluation of student performance.

# SECTION SEVEN

## SEMESTER - ITS IMPLICATIONS TO ADMINISTRATION

# SEMESTER SYSTEM - ITS IMPLICATIONS ON ADMINISTRATION

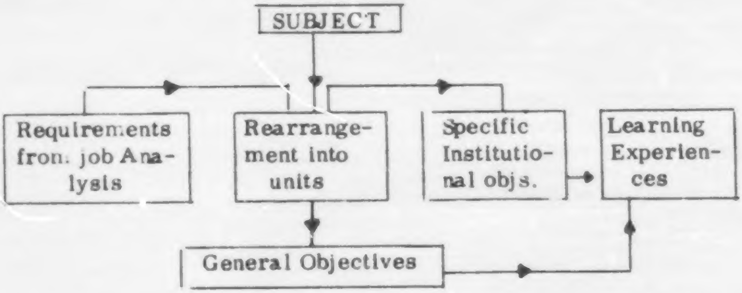
The semester signifies the division of the academic year into two parts. The division of the academic year also implies that courses are designed to cover one semester (instead of a year as in the case of the traditional annual system), and that final examinations are held twice in a year. So, it becomes inevitable to prepare the question papers, to conduct the examination, to evaluate the answer papers and finally to record the marks and announce the results twice in a year. The introduction of the semester system is bound to have some implications on the administration. By administration we mean the administration of the departments of a college, the college itself and the university

## 1. Administration at Department Level

Since the internal assessment type of evaluation is a part and parcel of the semester system by which students are assessed periodically, it is necessary for a department and its staff to be prepared for holding tests continually.

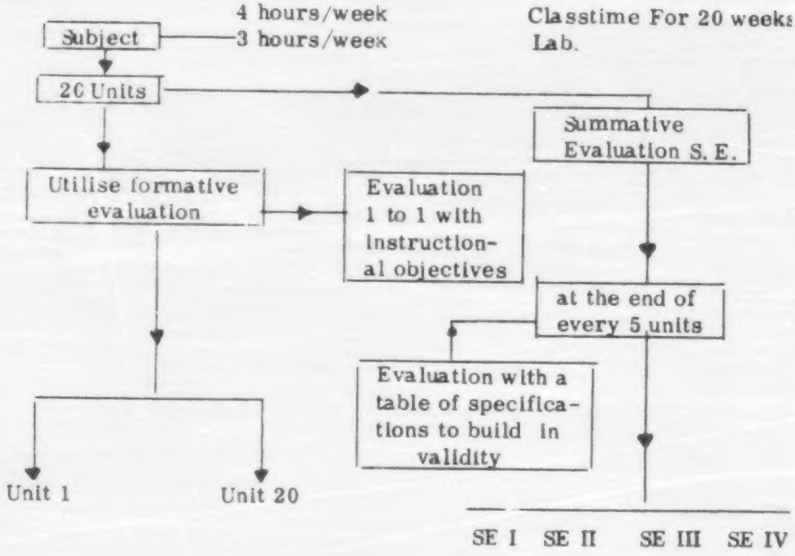
The lecturer incharge of a class prepares himself to conduct the assessment tests. After conducting the test, he should see that students taking those tests are evaluated correctly and their marks are noted in the mark sheets to be submitted to the university through the Head of the Department. In such cases, it is necessary to have an understanding between the various departments to conduct such tests on different days so that students are not overburdened by taking two or three types of tests in different subjects on the same day. This inter-Departmental understanding will help the student to concentrate more on a particular subject on a particular day and score better marks than when the tests are conducted at random. Here, the Head of the Department has to look after this problem and in consultation with his fellow-professors of other departments, plan the process & conduct of continuous assessment.

A schematic diagram of relationship of continuous assessment in a subject and its objectives is indicated below:


SUBJECT
Requirements from job Analysis
Rearrangement into units
Specific Institutional objs.
Learning Experiences
General Objectives

| Formative Evaluation | Summative Evaluation |
|---|---|
| 1. Short quiz | 1. Objective type test |
| 2. Objective type test | 2. Short answer type |
| 3. Short answer essay type | 3. Long answer type |
| 4. Long answer essay type | 4. Structured essay type |
| 5. Structured essay type | 5. Problem solving type |
| 6. Problem solving type-closed ended, open ended | 6. Performance type |
| 7. Performance type | |

8. Rating scales/Attitudinal scales
9. Inventories
10. Checklists
11. Assignments
12. Projects
13. Tutorials
14. Observations/interviews.


Subject
4 hours/week
3 hours/week
Classtime For 20 week
Lab.
20 Units
Summative Evaluation S. E.
Utilise formative evaluation
Evaluation 1 to 1 with instructional objectives
at the end of every 5 units
Evaluation with a table of specifications to build in validity
Unit 1
Unit 20
SE I
SE II
SE III
SE IV

The various components of continuous assessment:

1. Periodical tests called S. E. I to SE. IV: These are given at the end of every 5 units (5 weeks). The tests will invariably be prepared to specifications in the form of a Table and different types of questions to suit the objectives will be framed.

Each teacher in an affiliated college will prepare these periodical tests in his subject. However, there will be meetings of teachers teaching the same subject in all affiliated colleges, to discuss objectives, scheme, and prepare test items for periodical tests, assignments, tutorials, projects, practical work. This will help to bring about uniformity in standards.* An alternative will be to allow the constituent colleges to do this on their own and at the end a committee of moderators/assessors of the Headquarters will check up on the uniformity of standards in assessment. The former, i.e. building in uniformity in standards before implementation is desirable.

2. Assignments: Periodical assignments are given to students to enable them to get sufficient practice in problem solving skills. Every assignment, when marked, must be returned to the student and he must be given a set of correct answers. If time permits, the teacher must discuss with individual students where they are weak and suggest remedies. The marking of assignments can be done on quality, speed, methods, accuracy, application and originality with different weightages. There may be 4 to 6 assignments in the entire semester. These are class, home, library assignments and the like.

3. Practical work/Laboratory work: It is needless to say that objectives of laboratory work must be made clear to students. They must be encouraged to do both verification type and investigation type of experiments to promote learning in laboratory. Objectives of laboratory work range from knowledge (of instruments) to abilities ( to observe, make measurement, record, draw conclusions, write a report, devise new apparatus, devise new procedures to solve a problem) and skills (in handling instruments with ease, in making observations, handling data and computing. A new approach† to the tests for laboratory work has been suggested.

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* It is also suggested that sources like Question Banking books published by AIU may be consulted to make up materials for continuous internal evaluation, Question Bank Series, AIU, 1977.

† "A New Approach to construction of Practical Examinations in Surveying" Journal of Educational Research and Extension Vol. 9 No. 3 January, 1973.

Monograph on Practical Examination for Universities, Rs. 9/- AIU, 1979.

The related laboratory work must be spelt out at the beginning of the course and every laboratory experiment performed by individual students must be assessed on the basis of general approach, technique, accuracy, interpretations, conclusions, adopting different weightages.

4. Guided design projects: Students are given opportunities to work individually and in groups to solve open ended problems. This will enable them to work in groups like professionals and will help them develop abilities of analysis, synthesis and evaluation and certain personal developments like decision - making attitude, creativity, original thinking etc. A minimum of two projects (one individual and one in group) for every semester shall be given. A list of possible projects is to be kept prepared and students are to be guided at every stage of the project.

5. Tutorials: Tutorial time of 1 hour for every unit of study is to be set apart to train students to develop the ability to apply, think for themselves, think logically and solve closed and open ended problems.

6. Attitudes, interests, appreciation, hardwork, discipline, perseverence: These are evaluated by nontesting type of evaluation and done by checklists, rating scales and the like.

Making continuous assessment valid and reliable

| Form of continuous assessment | Validity | Reliability |
|---|---|---|
| 1. Periodical Tests | Tests prepared to suit a Table of Specifications. Individual teacher's responsibility or of a group of teachers | 1. Objective type test, structured essay type, problem type.<br>2. Marking scheme<br>3. Averaging a number of times; marking done throughout the course. |

| | | |
|---|---|---|
| 2. Assignments | Group of teachers decides on assignments to suit content/instructional objectives | 1. Heads of assessment and weighting them<br>2. Averaging a number of assignments given throughout the course. |
| 3. Practical work/ Lab. work/ Field work | Experiments/ exercises related to objectives and content.<br>A group of subject teachers will decide on the experiments to be given | 1. Heads of assessment and weighting them<br>2. Averaging a number of experiments/exercises throughout the course. |
| 4. Guided Design Projects | Projects related to objectives of the course. Projects that are likely to be professional in character. A Committee of Teachers/Industries/Departments/ firms sit round and decide on projects. | 1. Objectivity in marking with a schedule for marking<br>2. Averaging a number of tutorials during the course. |

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I. Below is given an individual assessment format for quiz (Announced & unannounced), short objective type test, short answer, problem solving, long answer essay type, class tutorials etc.

| S. No. | Test Number | No. of items | Score | Grade |
|---|---|---|---|---|
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |

II Below is given an individual assessment format for assignments (both class and home).

| S. No. | Assignment No. | Quality (4) | Speed (4) | Method (6) | Accuracy (6) | Application originality (5) | Total Grade (25) |
|---|---|---|---|---|---|---|---|
| | | | | | | | |

III Below is given an individual assessment format for individual/group guided projects/guided individual projects/group projects

| S. No. | Project No. | Individual Or group | Score | | | Total Grade |
|---|---|---|---|---|---|---|
| | | | Design (4) | Production (3) | Personal devt. (3) | (10) |
| | | | | | | |

IV Below is given an individual assessment format for lab./

field/practical work.

| S. No. | Practical No. | General approach (5) | Technical (5) | Accuracy (5) | Interpretation (5) | conclusion & report (5) | Total grade (25) |
|---|---|---|---|---|---|---|---|
| 1. | I | | | | | | |
| 2. | II | | | | | | |

Below is given the individual assessment for all the above mentioned. For the chosen assessment tests from quiz announced up to lab/field/practical work, the teacher is supposed to give his answer:

1. The number of assessment that the teacher proposes to give during a semester.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

2. The class size for that assessment.

☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

3. Indication of duration for those assessment in mts.

☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

4. Indication whether extra preparation and time is required on his part.

Yes ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

No. ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

## 2. Administration at college level:

In a college there are different departments of faculties which can work smoothly only in a cooperative spirit. The Principal, therefore, should appoint an examination committee consisting of all heads of Departments. This committee should settle all the procedures such as the despatch of assessment marks by the departments,of their dates, so that the announcement of the result is not delayed. The principal should also arrange for inter-collegiate seminars on subjects which are taught in the various colleges in the same area.

## 3. Administration at university level:

The university is the central agency for the proper functioning of the semester system, apart from recording the marks of the continuous internal assessment, made by different colleges. It has to set the question papers of the semester, evaluate the answer books, record the marks of the external semester combined with those of continuous internal assessment if necessary and finally award a suitable class or grade before announcing the results.

For this purpose, it is necessary to have in the university an Examination Reform Cell and a Paper-setting and evaluation committee. The cell should have sections under a coordinator, a statistician and research assistant with proper qualifications and experience in the field of examination reform. They should be familiar with the new pattern of teaching-learning-evaluation. The paper-setting and evaluation committee should insist on a centralised pattern. The concerned teachers should discuss the general syllabus pattern and the other criteria and in the light of their agreed decisions prepare a set of question papers. These would be used for the semesters and some of them could also be kept in reserve for further use.

Similarly, it would be advisable to have centralised evaluation. This would help in announcing the result of the previous semester before the beginning of the following semester course. It is generally felt that some capital investment in computers etc. is necessary in order to facilitate analysis, tabulation of marks etc. But computers are not essential. In fact, long before computers were invented American Universities had semesters, credits and declaration of results in a week or two .

Finally, the use of libraries as a Resource Centre in the semester system should not be lost sight of. Lectures and other teaching methods apart, the student must be encouraged to read text-books and other relevant literature by giving him reading assignments in the library. He should be required to prepare term papers on selective topics, since the quality of this work is also assessed. In this way he not only absorbs more knowledge but learns better in the class room. The open access system is particularly helpful in kindling his interest in reading not only books which are of immediate concern to him for his study but other literature also. This is an excellent habit for a student to cultivate in his college years, apart from making the semester system really effective.

## SECTION EIGHT

## IMPLEMENTATION AND EVALUATION

## IMPLEMENTATION AND EVALUATION

It was pointed out earlier that in applying 'systems approach' to the design of 'semester system', a very important step in the process of it is the stage at which 'implementation' of one of the alternative solutions is taken up. Very often, a pilot trial or experimentation is attempted and 'evaluation' of the system being implemented is done. Based on the results of evaluation, it shall be possible to modify if necessary, the goals and objectives or the design. Thus 'evaluation' acts as a 'feedback' to improve the 'system design'.

In the implementation of semester system as designed by all the faculty of a university participating in filling up the questionnaires and arriving at consensus, there are several possibilities. One way is to try this on a pilot trial basis in a few colleges for this purpose. These colleges may be those who have good and devoted and trained staff, fairly motivated students, good physical facilities and those who have established standards of performance in the past. Based on the trials and the results of evaluation of the semester system in these colleges, it shall be possible to modify and introduce the system in all other colleges.

Indeed in universities where the semester system has worked and also stayed on, this strategy has been adopted. In certain other universities, simultaneously semester system was introduced in all colleges without adequate preparation of teachers students and administrators in implementing a system of semester courses and examinations. These universities have found it extremely difficult to continue with it.

In this monograph, it has been stressed that semester system is an open ended problem and it has many alternative, equally feasible solutions. A particular chosen solution will work with the teachers, students, parents and administrators in one situation. It is therefore necessary to design the details of semester system in different courses rationally and scientifically and a questionnaire of the kind illustrated in this monograph is got to be filled by as many teachers in each subject areas as possible: a consensus of their views and responses worked out: It has been demonstrated that the consensus relate to :

a. clarification of basic principles
b. clarification of objectives of semester system
c. clarification of relationships between instructional objectives of different courses methodology of assessment.
d. clarification in relation to continuous assessment as a part of semester.
e. clarification on the implications of semester system on syllabus, methods of teaching/learning.
f. clarification on the implications of semester system on the end external examination.
g. clarification on the implications of semester system on administration at teacher, department, college and university levels.

It has been demonstrated that a design emerges with details like:

1. objectives of semester system in a particular subject area.

2. detailed syllabus clarifying things like:

   a) all subject matter to be taught b) student activity
   c) link with other subjects d) depth of treatment
   e) industrial, live examples f) students' abilities and skills to be developed g) student's social skills to be developed h) methods of teaching, teaching/learning aids i) time allocation j) class room organisation k) methods of evaluation, type and frequency of periodical tests, assignments/tutorials/projects/ laboratory/practical/field work/discussion/seminar.

3. a plan of action to implement the semester system.

It is also important that not only all teachers participate in filling the questionnaire and designing, they are also to be trained to implement. Such a training programme spread over a few days should concern bringing to them the implication of such a semester scheme on their role as teachers, on the role of students and on the administrators. The author has conducted many such * semester system training workshops in various universities and have found that teachers attending these are by and large motivated to get trained.

With regard to implementation of such a semester system, there are several alternatives; a few are being discussed here. A university may well decide to introduce semester system for all courses (undergraduate and or post graduate) in all subjects in all colleges alternatively the university may also decide to introduce semester system for few select courses (undergraduate and or post-graduate) in a few select colleges and later extend it in all subjects in all colleges. The actual choice will depend upon the local situations. In any case, it is extremely important that adequate preparation and sufficient time is considered before implementation of the system. In an affiliating type of university, it is necessary to get various bodies like syndicate, Academic Council, Boards of Studies and Principals to know the details of the semester system; its technicalities, implications etc. It is vital that certain leaders (senior teachers) from various affiliated colleges are to be trained to implement semester system and these leaders will have to go back to their respective colleges to train others thus producing a multiplier effect:

During implementation, there must be an in-built program of evaluation of the semester system, the main purpose of which shall be to modify, correct mistakes and evolve a better design for implementation subsequently. Hence an evaluation of the semester system is to be undertaken both to evaluate the process as well as the product.

The purpose of evaluation to be undertaken, is to ascertain the effectiveness of semester system, to find out whether or not the objectives set forth to be achieved in a semester system have been achieved, to locate gaps and correct procedures, to gather information regarding implementations to feed it back to design criteria and evolve a modified design to implement subsequently. In addition to this, it is necessary to evaluate, individually and combinedly the components like semester syllabus, semester teaching semester learning and semester evaluation and semester

## SCHEDULE OF WORK

1. Mathematics, Physics & Chemistry } Groups
2. Botany, Zoology, Geology

| | 9. 00 A. M. to 10.30 A. M | 11 A. M. to 12. 30 P. M | 2 P. M. to 3 P. M. | 3. 30 P. M. to 5 P. M. |
|---|---|---|---|---|
| First Day | Semester system - its implications<br>L 1 | Methods of Teaching learning and testing<br>L 2 | Internal Assessment for semester system<br>L 3 | Going through a questionnaire on internal assessment A/P I |
| Second Day | Summary of Research (Pilot Study) on Internal Assessment<br>D 1 | Finalising Internal Assessment Design<br>A/P II | Restructuring Semester Examinations<br>L 4 | Design of Selection and Supply type Items/Questions<br>D 2 |
| Third Day | Question Banking for Semester Examinations and Internal Assessment<br>L 5 | Plan of action to Constitute Initial Question Banks<br>D 3 | Grading System<br>L 6 | Going through a Questionnaire on Grading - Designing A System<br>A/P III |

1. The same schedule of activities can be adopted for all groups.
2. Materials for this, will be handed over in person.

| | |
|---|---|
| L | Lecture, illustrations |
| D | Discussions |
| A/P | Assignment/Practice |

[*] Table giving details of such a course conducted by the author at Madurai Kamraj University.

administration. Since 'evaluation' is to be looked upon as a component.

System evaluation should be an integral part of the system-planning process. Provisions must be built into each program to collect information that will indicate progress towards the system's objectives, the degree of implementation of the plan and other information required to make rational decisions about the system. System evaluation is of little value unless some use is made of results. A part of the evaluation process includes identifying potential audiences for the evaluation report and finding out what kinds of information would be useful to them. Providing useful, timely information to people who can use it is one of the best ways of ensuring that the evaluation reports will be used. Usually the steps in system evaluation include

1. determine the evaluation purposes and requirements
2. develop an evaluation plan
3. determine the evaluation design and do the sampling
4. select or develop assessment instruments
5. collect the data
6. analyse evaluation data
7. report evaluation results
8. apply evaluation findings

The success of a system (like semester system) and of its evaluation depends to a great extent upon how clearly the evaluator understands at the start what things should be like at the end. If the decision makers are to have confidence in an evaluator's answers to policy questions about system effectiveness, costs and continuance, a number of questions must be asked at the outset and their answers clarified through the evaluation process. It is critical then to decide early in the evaluation process what purposes the system evaluation is expected to serve and who will be involved in defining them. In many programmes that are continued from year to year, such early planning consists of surveying the outcomes of previous years' activities and determining status and needs in the areas served by the programmes. The evaluator would then ascertain what goals and objectives have been set for the program and what these mean in terms of system evaluation. The link between system planning and evaluation planning is in the formulation of system objectives into terms that are measurable and with respect to which adequate measurement information can be collected and analysed to satisfy end-of year evaluation requirements. There are different purposes served by evaluation viz. communicating with the public, providing information to decision makers, improving the existing system and finally providing additional satisfaction to participants in the system.

## Communicating with the public

Colleges/Universities play to a number of audiences each of which makes evaluative judgments. These judgments usually are based on limited or partial information. Frequently, a community uses superficial newspaper/radio and /or television reports as the basis for evaluating the effectiveness of programmes and systems. The public also receives information about college programmes from students in the family and from other informal settings. This information may or may not be biased; however, judgments are nevertheless made. The public frequently derives its opinion of the efficacy of the educational system (semester system) through partial or at times biased information. It will be beneficial to educators, colleges and to their programmes to supply the public with comprehensive information, the best that can be provided. Reports to public must include system objectives and indicate the extent to which these have been realized. The public here means several audiences 1) parents 2) teachers 3) students 4) business community 5) industrial community 6) professional community.

## Providing information to decision makers.

Decisions made by school/college/university personnel are often critical and likely to have an immediate impact. System evaluation can be helpful in making such decisions. The information it produces may be applicable through all phases of educational management ranging from assessment made through system planning and implementation to the adjustment of objectives before repeating a system or program.

Educations often approach educational planning with nothing more than an intuitive sense of needs and sometimes proceed without validating these needs in the local setting. Likewise many educators have programmes, systems, objectives and plans in mind but no idea whether they are appropriate to meet the needs that have been identified. To increase programme or system effectiveness educations need to ascertain what needs exist and determine what programme will best meet those needs. Planning for system evaluation in an integral part of planning the system itself. Such preparation can serve to assume a continuing focus on the most important objectives and steady progress towards their achievement. Decisions to modify, expand or discontinue a programme or system are made through-out the stages of its development. Systematic evaluation provides a sound basis for the decisions that are needed. Various decision makers are the teacher, principal of the College, chairman, members of Board of Studies, Vice Chancellor and others. One must consider needs at each of these levels of decision making when gathering the needed information.

## Improving existing system or programme

An effective system evaluation can help ongoing programmes operate more effectively by providing feedback to staff about what is happening. Relevant system evaluation information may make possible a greater degree of individualization of instruction and also more effective groupings of students for instructional purposes. Information about the effect of the different aspects of the program or the system on students may enable the staff to identify the factors which may need modification as the system or programme proceeds.

## Providing additional satisfaction to participants

System evaluation differs from individual evaluation in that it measures objectives which apply to group of persons, academic department, or an entire college or group of colleges. Therefore evaluation of programme or system can be conducted (it will have to be) in a context of mutual help rather than posing individual threats, as sometimes occurs in teacher evaluation or imposing too much testing, as sometimes occurs in student evaluation. System evaluation must be designed to give useful information to students and system implementers. Especially if a student's progress as shown in a system/programme evaluation is compared to his own previous performance, he is likely to see progress and feel positive about his growth. The beneficiaries in such a situation clearly are the students and the instructional staff. Questions they would like answered are important and most assurdly to be built in as part of the evaluation plan.

System evaluation is a process of determing the value or effectiveness of an activity for the purpose of decision making. In semester system evaluation we have planning, designing, teaching, learning, evaluating activities. When a system evaluation takes place, the decision maker is concerned with determining the net value of something, its costs in relation to its benefits. To what extent a particular aspect or the whole system was effective in meeting identified need or objectives, will also be useful to look at. There are two basic types of system evaluation; these are Formative and summative:

Formative evaluation takes place during the development of a program/system or instructional unit. It is concerned with fine turning the implementation processes and measuring learner progress as the program moves toward the attainment of specified objectives. There are possible mid course corrections as a result of formative evaluation.

Summative evaluation takes place at the end of the system or an instructional unit. This type of evaluation is concerned with the success (or failure) of operational procedures. The data to be collected in semester system evaluation can be visualized as follows:

a. Product data: focussing on the outcomes, results or products of programme activity in the semester; Product data must be related to established programme/system goals and objectives e.g. an end of the year summative evaluation of an undergraduate Physics course with the goal to be able to apply laws of motion might show that 75% of the performance objectives were success-

| | | |
|---|---|---|
| | | fully accomplished by 75% of students. |
| b. | Process data | focussing on the activities and procedures applied to the achievement of the desired outcomes; purpose is to collect information which will help determine the effectiveness of various things done in the operation of a system; information about clarity of syllabus, teaching methods, learning strategies evaluation and assessment methods etc. |
| c. | Context data | describing the environment in which the system activities are taking place including facilities, equipment, supplies, rules, policies, class organization, teacher skills/ behaviours, attitude/support of Principal/ Board Members/Vice Chancellor toward the semester system, discipline, scheduling. |

## Semester System evaluation

One of the first things that a system evaluator should do is to become familiar with the semester system to be evaluated. If the evaluation has been part of semester planning, the evaluator probably will have been involved in planning the programme from its inception. He or she has become probably familiar with learner, educator and community needs when these were identified . The evaluator will learn how objectives were set and they were seen to be related to existing needs. The evaluator will then review goals and objectives, whether stated in unambiguous terms. Clearly stated objectives are the key to the evaluation process because they set the stage for deciding the nature of evaluation, the kind of design, types of instruments, resources required to perform and the style and organization of evaluation reports.

## Form I Evaluation Information Requirements Form

| Who requires information | What information is required | Date required | Use to be made of information |
|---|---|---|---|
| Princiapl of College | Reports on observations of classroom activities | Nov. 15<br>Dec. 15<br>Jan.15 | To determine if the instructional programme has been implemented as planned |
|  | Teacher para professional reactions to inservice training programme | Oct. 1 | To determine effectiveness of the inservice training programme for revising programme if required. |
|  | Student progress in science achievement. | Jan.15 | To determine whether students are achieving at the expected rates. |

## CHECKLIST OF THE STEPS IN DETERMINING EVALUATION PURPOSES AND REQUIREMENTS

|  | Step Started | Date Completed |
|---|---|---|
| DEFINE EVALUATION PURPOSE |  |  |
| • Determine from decision makers the purpose of the evaluation. The purpose will dictate the types of evaluation that must be conducted. |  |  |
| REVIEW NEEDS ASSESSMENT, PROGRAM GOALS, AND PROGRAM OBJECTIVES |  |  |
| • Determine whether a needs assessment was conducted by the decision |  |  |

makers.

- Review program goals to determine whether they address the needs or problem areas.
- Review performance objectives to determine that they are compatible with program goals. Are the objectives stated in unambiguous terms?

## REVIEW PROGRAM ACTIVITIES

- Review program activities to judge whether they can be expected to contribute to achievement of the objectives.
- If the activities do not match the objectives, recommend that activities or objectives be revised.

## IDENTIFY EVALUATION REQUIREMENTS

- Request that decision makers identify the information they will require to make end-of-the-year decisions about the program.
- Determine process, product, and context data that should be collected.
- Determine the information required by decision makers to make interim decisions.
- Determine when the information is required

## IDENTIFY EVALUATION RESOURCES AND CONSTRAINTS

- Determine the resources and constraints which will affect the conduct of the evaluation.

- Advise decision makers of those resources which are available and those that are required
- Submit recommendations to decision makers for reconciling discrepancies between resources available and those required.

## INDIVIDUAL WORKSHEET

PROGRAM GOAL NUMBER__________KEY WORDS______

TOTAL NUMBER OF PANEL MEMBERS__________________

| Objective Number | Rating of objectives and tallies of ratings | | |
|---|---|---|---|
| | Not Important | Important | Very Important |
| | 0 | 1 | 2 |
| 1 | ☐ | ☐ | ☐ |
| 2 | ☐ | ☐ | ☐ |
| 3 | ☐ | ☐ | ☐ |
| 4 | ☐ | ☐ | ☐ |
| 5. | ☐ | ☐ | ☐ |
| 6 | ☐ | ☐ | ☐ |
| 7. | ☐ | ☐ | ☐ |

| | | | |
|---|---|---|---|
| 8. | ☐ | ☐ | ☐ |
| 9. | ☐ | ☐ | ☐ |
| 10 | ☐ | ☐ | ☐ |
| 11. | ☐ | ☐ | ☐ |
| * 12. | ☐ | ☐ | ☐ |
| * 13. | ☐ | ☐ | ☐ |

*These numbers represent objectives which have been written by the panel.

Having learned the system's objectives (semester system's) and needs, the evaluator then constructs a series of questions that will be used after the system's completion to determine if it has achieved its objectives. He decides then on the instruments needed to gather the necessary information and whether they will be selected from available instruments or developed. A schedule is then drawn up for the administration of the instruments. Decisions will be made about the kinds of analyses that will be performed on the data and how the final information will be reported and to whom.

## PROGRAM EVALUATION PLANNING FORM

Program ____________________

Purpose(s) of Evaluation ____________________

Audience(s) for Evaluation ____________________

| | |
|---|---|
| PROGRAM OBJECTIVES | |

| | |
|---|---|
| EVALUATION DESIGN | |
| ASSESSMENT INSTRUMENTS | |
| ADMINISTRATION DATES AND PERSONNEL | |
| DATA-ANALYSIS TECHNIQUES | |
| MONITORING PROGRAM ACTIVITIES | |
| MONITORING DATES AND PERSONNEL | |
| KEY REPORTING DATES | |
| WHO IS TO RECEIVE THE REPORT(S) | |
| DETERMINING HOW THE DATA REPORTS WILL BE USED | |

The selection of appropriate assessment instruments depends on the kind of information needed to answer the questions posed in the evaluation;some of these are:

a. Norm referenced tests
b. Criterion referenced tests
c. Questionnaires
d. Interview guides
e. Observation record books

f. Rating sheets
g. Log sheets
h Record summary forms.
i. Structured narrative reports.

The instrument choice depends on whether the instrument measures what is to be measured; whether the instrument yields consistent information; whether it is appropriate for the population;whether it is easy to administer; whether the cost of the instrument its administration and its scoring reasonable etc. Once dates have been set for administration, personnel are to be assigned to administer them. Data analysis consists of organising a quantity of data so that its meaning may be understood. Techniques of analysing data range from a simple rank ordering of scores to very complex statistical treatment. Data analysis helps to bring out relationships that are not apparent; to compare different groups or the same group at different times. Some methods of arranging or displaying data for analysis: total raw scores, Mean Scores, median scores, model scores, Percentage scores, Rank order listings, Frequency distribution and correlations.

## CHECKLIST OF THE MAJOR STEPS REQUIRED IN DEVELOPING AN EVALUATION PLAN

| | Check | | |
|---|---|---|---|
| | In Progress | Completed | Date Completed |
| • Review needs assessment and goals and objectives to determine their interrelatedness. | | | |
| • Identify the purposes for which the evaluation is being conducted and the probable uses of the evaluation. | | | |
| • Review objectives to ensure they are written in measurable terms. | | | |

| | | | |
|---|---|---|---|
| • Identify the questions that must be answered at the end of the year as indicated by the objectives, the purposes, and the probable uses of the evaluation. | | | |
| • List appropriate kinds of instruments to gather the information required to answer the questions formulated above | | | |
| • Determine approximate dates when the various kinds of information would most appropriately be gathered. | | | |
| • Determine types of data-analysis procedures that would give the most appropriate information to answer the questions formulated earlier. | | | |
| • List the activities that need to be monitored together with most appropriate dates to secure the information. | | | |
| • List the kinds of reports that will be made, both interim and summative; who will receive these reports; and the dates the reports are due. | | | |
| • For each report, list the potential uses to be made of the information and be sure that they match the information to be gathered. | | | |

A question of primary importance in system evaluation is: "How much more did students learn by participating in the program than they would have learned without it?" This means: 'How much students improved between the time the semester system began and ended? and an estimate of how they would have done without the program. A model of 'Premeasurement - System Post-measurement' is to be adopted. A single group time-series design uses students in the pgoramme/system as their own control group. The same measurement is made on the same student, at regular intervals several times before and after the programme/Semester. Whenever possible some kind of reference group should be used to compare the status of programme/semester participate to that of similar persons not participating in the programme/System. There are three kinds of groups viz control groups, comparison groups norm groups. Care must be taken that persons in the reference group are as much like those in the system as possible with reference to age, ability, reading level, ratio of males/Females, number of minorities etc. Overall group profiles should be similar with reference to these. How do non system (semester here) students identical with system students compare with regard to growth. This means that:

System Students: premeasurement _____system
_______post-measurement

Non system students: premeasurement___________
postmeasurement

How do comparable nonsystem students compare with system students?

System Students: premeasurement ____System___
_____postmeasurement

Non system students: premeasurement _______ post-measurement.

Next question will be. "What elements of the system contributed to the gain" If we know what elements of the system made more difference and which made less, we would be in a position to make improvements in the system. Information about effective and less effective elements could be used to reallocate sources of time and money. If we know what elements were essential, we could prodict the chances of the system being successful elsewhere. Some of the elements in our semester system are:

1. Semester syllabus
2. Semester goals & objectives
3. Semester teaching methods
4. Semester learning
5. Semester evaluation with continuous assessment
6. Semester administration.

## System syllabus evaluation:

A proforma of rating scale* can be used with reference to the syllabus and a group of teacher who have made use of a particular syllabus are asked to fill in independently and a consensus Coefficient of clarity arrived at. Atleast 60% clarity coefficient is to be insisted

## Semester Goals and Objectives Evaluation:

Each one of the goals and objectives, (listed below) is taken taken and evaluated for its importance, for its attainment, for the degree of attainment. There are about fourteen objectives which can be achieved by the implementation of the semester system. They are:

a. The quantites of content in various subjects would be proportioned suitably into semesters.

b. This helps students to achieve their objectives in a better way.

c. There is greater freedom to change the subject and the combinations even in the middle of the course.

d. There is flexibility to choose the number of courses in every semester between two and seven.

e. Continuous assessment being an important component of semester system encourages the students to work systematically throughout the course.

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*The syllabus analysis rating scale proforma has been given in the questionnaire on page 77 of Chapter V.

f. There is increased self reliance on the part of students in respect of schedule, evaluation and performance improvement.

g. Shortage of attendance in a subject is no bar to the student taking examinations in other subjects where attendance required is fulfilled

h. Continuous internal assessment with more emphasis on abilities that are not tested by a semester examination forms an integral part of the system.

i. It is therefore necessary to keep internal assessment and external semester examination marks/grades separate.

j. Students have the opportunity to discuss their answers in all accepted tools of internal evaluation. This adds to reliability.

k. One of the components of Internal Assessment, namely periodical tests, prepares students continuously for the final examination, thereby eliminating the fear of the unknown.

l. Semester system does include improved methods of assessing student performance in semester examination, making increased use of objective type testing.

m. A Question Bank, if made available, will help in the effective implementation of semester system.

n. In a semester system, there is increased rapport and relationship between teachers and students.

Some need filling by teachers/Students; some need to be observed in the class-room; yet others will be evaluated at the time of in-course measurement and end of term/Semester achievement measurement. A report on this evaluation is to be comprehensive and detailed.

Semester teaching methods

Here teaching ability/instructional material can be evaluated.

A check list of different methodologies * can be looked at and after observation, these can be filled up by a Number of evaluators and a consensus arrived at.

Similarly instructional materials of different kinds can be compared for effectiveness.

A consolidated report on this is essential for system evaluation

## Semester learning

Students passing through semester system (syllabus/teaching must be compared to non semester system students in terms of learning ability, (revealed by achievement test scores to control and system groups), rate of learning and the motivation for further learning. Techniques to be used are rating scales checklists, observations, interviews, achievement batteries etc.

## Semester evaluation of student performance

Continuous Assessment: details with regard to components of continuous assessment, weightages, objectives, modus operandi are to be studied with reference to planned things and the implemented aspects.

End external examination semester end examination pattern, types of question/items, test and item analysis data must be compiled to prove the effectiveness or otherwise of the semester end examination.

## Semester Administration

Implications of semester system on the roles of teacher, student, parents, administrators are to be evaluated with reference to what was planned. The time, effort cost saved with reference to preparation of semester examinations administration, marking, recording, reporting and announcing results must be

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* The check list of different methodologies for teaching/learning activities has been given in the questionnaire on page 82 of Chapter V.

compared with traditional annual system and compared also with what was planned.

Thus summarising, implementation and evaluation must go hand in hand: and that evaluation must generate a lot of information which will have to be systematically studied and used to modify, improve and implement more effectively semester system subsequently.

# SECTION NINE

# FUTURE OF SEMESTER

# FUTURE OF SEMESTER SYSTEM

At first sight, the slowness with which any kind of reform is accepted and implemented is perplexing and troubling. One would expect everybody to be interested and supportive when the reforms proposed are an attempt to enable people to deal more happily and effectively with the problems they face or quite simply to improve the quality of life and work. But this is by no means the case. As a general rule, such reforms are opposed and bitterly criticized, particularly by those who believe, often mistakenly that their own position or privileges would be adversely affected. People may use the most outrageous arguments, like those who claimed when the steam locomotive was coming into use that speeds in excess of 40 mph would disintegrate the human organism and the air pressure in tannels would collapse he lungs. The airplane, the super sonic jet and the spaceship [illegible] and are - exposed to similar attacks. In the field of education resitance to reform is no less strong.

But reform certainly does take place. Among certain groups, like the young and the radicals, the novelty of a reform is often seen as a recommendation in itself. But even then only certain kinds of reform namely those in live with particular ideologies are welcomed. Only when change obviously, immediately and directly affects/improves ones own lot of life is it fully endorsed. A more difficult problem is institutional reform.

Sometimes it is necessary to clarify the differences among concepts of change innovation and reform. Innovation is a deliberate attempt to improve practice in relation to desired objectives; and considers reform to be innovation on a system-wide scale. Educational change is by far the most general notion and does not necessarily imply improvement. It simply connotes adaptation which may be progressive or regressive in the long term. Educational innovation is to be interpreted to include relatively partial, fragmented, often isolated technical improvement of educational practices based on innovation, research and the application of new techniques. It is generally limited to the extension and improvement of educational practice. As such it does not fundamentally change contemporary practice, it merely improves upon it . Educational reform also requires improvement and generally includes some aspects of innovation but it goes further. It involves major changes in educational objectives and policies and thus is always a political action with strong ideological overtones though it need not be a large scale change. Reform affects more than one discipline . For example, the major reform of an education system.

Semester system is therefore an educational innovation. Education like all social institutions is never static; it envolves and changes over time. Few educators would oppose the principle of continual change as education to some degree reflect societal changes. Societal demands concerning the essential skills of clientele. Disagreement more often occurs when discussing the rate of change,the direction of change or the means of achieving a changed state. If change is slow and systematic, errors in conception or direction of change are manageable and can be corrected with relative ease. If the change comes too quickly, is not adequately planned or if the people who must make the change work are unconvinced of its necessity or are incapable of adapting themselves to it, then rapid change can be a destructive force and a regressive move. As society consists of people of varied convictions, there are those who resist change; others who live with it and still others who lament its lack of immediate accommodation of education systems to their own personal views. The most easily acceptable form of educational change is innovation . Since it involves either minor extensions and improvements of contemporary practice in general, or more major initiatives restricted to parts of the education system, it can generally be endorsed. True, some may have to learn to deal with new materials or methods of teaching but their willingness to do so often gives them prestige, status and ultimately advancement in the profession. Furthermore, in most instances, those who contribute to the implementation of innovations are volunteers.

In the light of all these, it can be said that the innovation of introducing a semester system has got to be approached with scientific precision. It is extremely necessary that the decision-makers in a university/institution must be informed of the basic and fundamental principles of semester system, its goals and objectives, semester syllabus, teaching/learning/evaluation methodologies, implications on teachers/students/partents/administrators. Certain basic psychological principles are to [illegible]lt in — namely

- those who are going to implement must participate in decision making and give views to various issues.

- a consensus design of semester system (through the consolidation of responses to a questionnaire as detailed in this monograph) must be evolved.

- a proper training programme for teachers in semester system implementation is to be held.

- information must be passed on to teachers/students/parents/administrators about semester system sufficiently in advance.

- implications of adopting a semester system on administration, practices, record keeping, procedures etc must be studied and prepared for.
- adequate preparation time must be allowed

- a few volunteers and other well established colleges must be allowed to experiment and evaluate

- a systematic 'system evaluation' must be instituted and results reported to people concerned.

- modification, improvements are effected based on results of evaluation.

If 'Semester System' is approached in this scientific and rational way, there is no reason why it should fail. Finally the future of the semester system in our country in universities/institutions will depend upon the availability of trained manpower in teachers/administrators and others and certainly it is a system that will come to stay.

# APPENDICES

ONE

# LIST OF UNIVERSITIES/INSTITUTIONS ADOPTING SEMESTER SYSTEM

Following is the list of Universities/Institutions which have replied that SEMESTER SYSTEM is not followed at First Degree Level.

1) University of Allahabad 2) Awadhesh Pratap Singh University, Rewa 3) Berhampur University 4) Central Instt. of English and Foreign Languages, Hyderabad 5) Dhakshina Bharat Hindi Prachar Sabha, Madras 6) Gauhati University 7) Gujarat Ayurved University 8) Gujarat Vidyapeeth 9) University of Hyderabad 10) Indra Kala Sangit Viswavidyalaya 11) Jabalpur University 12) University of Jammu 13) University of Kashmir 14) Maharishi Dayanand University, Rohtak 15) North-Eastern Hill University 16) Punjabi University, Patiala 17) Rabindra Bharati University 18) Ranchi University Ranchi 19) Sambalpur University 20) Sampurnanand Sanskrit University, 21) University of Saugar 22) Utkal University 23) University of Agricultural Sciences 24) Haryana Agricultural University 25) Indian Agricultural Research Institute, New Delhi-12 26) Kerala Agricultural University 27) Rajendra Agricultural University 28) G. B. Pant University of Agriculture & Technology 29) Punjab Agricultural University 30)Tamil Nadu Agricultural University.

## 1 ANDHRA UNIVERSITY

Semester system has been introduced for Post degree level in most of the Faculties of Arts and Science since 1972-73, in the Faculty of Engineering and Technology since 1971-72 and for B. L., B. L. Sc., since 1972-73. Details regarding year of introduction for various subjects follow:-

### POST DEGREE LEVEL

| Faculty of Arts | Year of Introduction |
|---|---|
| Maths, History and Archaeology, Law, | |

| | |
|---|---|
| Economics, Hindi, Applied Economics, Lib. Science and Psychology | 1972-73 |
| Social work, Politics and Public Administration | 1974-75 |
| Philosophy | 1973-74 |
| English, Telugu, Commerce, M.B.A. Sanskrit, Sociology, Industrial relations & Labour welfare | 1974-75 |
| Anthropology | 1975-76 |
| Faculty of Science: | |
| Physics, Chemistry, Botany, Zoology, Geology, Applied Physics, Geophysics, Meteorology, Nuclear Physics. | 1972-73 |
| Bio-chemistry, Human genetics and physical Anthropology, Pharmacy and Bio Sciences. | 1973-74 |
| Statistics | 1975-76 |
| Marine Sciences | 1976-77 |
| Faculty of Engineering (B.E.) | 1971-72 |

In the first degree level, semester system of teaching is provided only in the following courses. (i) B.E. (ii) B.L. (iii) B.L.Sc. (iv) B. Pharm.

I (B.E.) Bachelor of Engineering:

The duration of this course is five academic years consisting of ten semesters. The courses of study prescribed shall provide for specialisation in the following branches. (i) Chemical Engg. (ii) Civil Engineering (iii) Electrical Engineering (iv) Electronics and communication Engineering (v) Mechanical Engineering (vi) Mechanical Engineering with Marine Engineering electives (vii) Metallurgy.

The first year of study shall consist of two consecutive terms of 150 working days in all and each academic year from the II year shall consist of 2 semesters each of 75 working days duration excluding the period of end of course examinations.

Regular course of study means attendance at the lectures, tutorials, practicals, drawing classes, workshop practice and field work, if any, in each year or semester according to the scheme of instruction prescribed.

A candidate shall be required to put in a minimum attendance of 75% failing which he shall not be permitted to attend the courses of study of the next semester. The performance of the students in the first year and in each semester thereafter shall be evaluated course wise on the basis of a written examination at the end of the year/semester and sessional work during the year/semester.

The written examination at the end of a year/semester in theory or drawing courses shall be of three hours duration and shall carry 50 marks.

Sessional work during a year/semester for theory or drawing course shall carry 50 marks and shall be evaluated on the basis of (a) one class test not less than of $1\frac{1}{2}$ hour duration carrying 30 marks and (b) two quizzes of about 30 minutes duration carrying 10 marks each. A make up class test shall be held for the benefit of those students who could not appear for the class test for any reason. There shall be no make up tests for the quizzes. As far as possible, those tests shall be evenly distributed during the year/semester.

For drawing courses, 20 marks weightage may be given to the drawing sheets drawn during the session, cancelling the two quizzes mentioned above at the discretion of the concerned department/section head.

The scheme of Evaluation for the workshop/laboratory/project courses each of which carries a total of 100 marks shall be on the basis of terminal practical examinations and/or viva-voce and sessional work during the course. The weightage for those shall be fixed by the department/section head concerned.

Upon successful completion of each course, a candidate shall be awarded one of the following five grades with the associated grade points.

| Grade | A | B | C | D | F |
|---|---|---|---|---|---|
| Points | 10 | 8 | 6 | 4 | 2 |

## Eligibility for the award of B. E. or B. Tech.

The candidate (a) shall have passed all the courses of all the years/semesters and (b) shall have secured a C. P. I. of not less than 5. 0

A candidate passing with a C. P. I. of 8. 5 or more shall be deemed to have passed in First class with Distinction.

A candidate passing with a C. P. I. of 6. 5 or more but less than 8. 5 shall be deemed to have passed in I class, A candidate passing with a C. P. I. of 5. 0 or more but less than 6. 5 shall be deemed to have passed in II class. For computing the percentage of marks deemed to have been secured by a student, the C. P. I. or S. P. I. shall be multiplied by 10.

## FACULTY OF LAW (B. G. L. and B. L.)

The duration of this course of study is three academic years, each consisting of two semesters; each semester shall be of sixteen weeks duration of which shall exclude the period of examinations.

A candidate shall have to take instruction in I to IV semesters in all the subjects specified for him as compulsory, and in any six of the optional subjects three in each of the V and VI semesters. Instructions in each course shall be in the form of lectures, tutorials and practical work.

The practical training shall consist of excercises in drafting and pleading, attendance at lectures on professional practice and Ethics, witnessing trials in courts, and participation in moot courts. 25 marks shall be awarded by the teacher concerned in respect of drafting and pleading exercises and trials in courts.

25 marks shall be awarded by the concerned judges for performance in moot courts. The viva-voce examination shall be conducted by a Board of Examiners, of whom two shall be teachers in the Department of Law, and one from outside the university. The viva-voce examination shall be with a view to test the standard of knowledge of law attained by the student, and be generally confined to the subjects studied by the student in the VI semester. The valued answer scripts of the student in those subjects shall be made available to the Board.

Scheme of Evaluation:

a) Evaluation of student performance shall be subject wise

b) The performance of a student shall be judged by

i) Semester -end examinations; ii) continuous in-semester assessment.

c) The semester end examinations in respect of each subject carrying 100 marks shall be of three hours duration and in Legal and Constitutional History and Law of Evidence, it shall be of two hours. The examinations will be held on the dates notified by the Head of the Department.

d) The distribution of marks between the semester end examinations and the continuous in semester assessment, subject wise shall be in the ratio of 75% and 25% respectively.

e) The marks for continuous in-semester assessment in respect of each subject for (i) Mid semester examination and (ii) Home assignment or Library assignment, shall be 15% and 10% respectively. The midsemester examinations shall be of two hours duration.

f) A candidate shall not be eligible to take the semester end examination in any subject unless he has attended not less than 66% of the lectures and tutorials in that subject.

g) Only one make up mid-semester examination shall be given for absentees.

h) Candidates obtaining not less than 45% marks in a subject shall be deemed to have passed in that subject.

i) Candidates failing in any subject shall be permitted to take supplementary semester end examination in that subject to be conducted not later than two months after the commencement of the next semester, on a day to be notified a week earlier by the Head of the Department. However, the marks obtained in the continuous in-semester assessment shall not be altered unless the candidate chooses to repeat the subject.

j) A candidate shall be permitted to take the supplementary semester end examination only once. In the event of failure in the supplementary semester end examination, he shall be required to repeat the subject.

k) Candidates who have successfully completed a subject shall not be permitted to re-appear for examination in the subject.

l) A candidate shall be deemed to have passed in practical training, moot court and the viva voce if he obtains not less than 45% of marks in all of them taken together.

## Classification of Candidates:

i) The names of successful candidates at the B. L. Examination shall be arranged in the order in which they are registered for the examination in three classes, on the basis of the total marks obtained by each candidate in all the subjects, practical training moot court and viva voce taken together as follows:

| | | |
|---|---|---|
| a) | I class with distinction | Those who obtain 70% or more. |
| b) | I class | Those who obtain 60% or more, but less than 70% |
| c) | II class | Those who obtain 45% or more, but less than 60% |

ii) Candidates who have failed in the B. L. Examination because of failure in the VI semester end examination and/or viva-voce examination shall be permitted to take a supplementary VI semester end and /or viva voce examination within four weeks after the commencement of next academic year.

## BACHELOR OF GENERAL LAWS DEGREE (B.G. L.)

A candidate who passes the first four semester examinations shall be eligible for the award of the degree of B. G. L. Classification of successful candidates shall be in the case of B. L. candidates.

## BACHELOR OF LIBRARY SCIENCE EXAMINATION (B. L. Sc.)

The duration of this course of study in the department of library science is for a period of one academic year consisting of two semesters each of sixteen weeks duration, ordinarily consecutive. The duration of a semester shall exclude the period of examination.

### Scheme of Instruction

The scheme of instruction and Examination for each of the two semesters is as follows:

| Paper No. | Mid semester Exam. marks | Assignment Records | Semester end Exam. marks. | Duration |
|---|---|---|---|---|
| I SEMESTERS | | | | |
| Paper I | 25 | 15 | 60 | 3 hours |
| Paper II | 25 | 15 | 60 | 3 " |
| Paper III | 25 | 15 | 60 | 3 " |
| Paper IV | 25 | 15 | 60 | 3 " |
| II SEMESTER | | | | |
| Paper V | 25 | 15 | 60 | 3 " |
| Paper VI | 25 | 15 | 60 | 3 " |
| Paper VII | 25 | 15 | 60 | 3 " |
| Paper VIII (Optional) | 25 | 15 | 60 | 3 " |

| | | | | |
|---|---|---|---|---|
| Guided project work (under the guidance of a teacher, Not more than 2 students/teacher in the Department) and Viva Vice | - | - | 100 | - |

Instruction in each course shall be in the form of lectures, tutorials, seminars and practical work.

EVALUATION:

a) Evaluation of student performance shall be course-wise.

b) The performance of a student shall be judged by (i) semester end examinations; (ii) Continuous in-semester assessment.

c) The semester end examination in respect of each course shall be of three hour duration.

d) The distribution of marks between the semester end examination and the continuous in-semester assessment course-wise shall be 60% and 40% respectively.

e) The marks for continuous in-semester assessment in respect of each paper for (i) mid semester examination and (ii) home assignment record shall be 25% and 15% respectively. The mid semester examination shall be of 2 hours duration.

f) Only one make up mid semester examination shall be given for absentees.

g) Candidates obtaining less than 40% marks in a course considering both the semester-end examination as well as continuous in-semester assessment shall be deemed to have failed the course.

h) Candidates failing a course shall be permitted to complete the course by taking supplementary semester-end examination to be conducted not later than 2 months after the commencement of the next semester on a day to be notified a week earlier by the Head of the Department. How ever, the marks obtained in the continuous in semester assessment shall not be altered unless the candidate chooses to repeat the course.

i) Candidates shall be permitted to take the supplementary semester-end examination only once. In event of failure in the supplementary semester-end examination he/she shall be required to repeat the course when it is next offered.

j) Candidate who have successfully completed a course shall not be permitted to reappear for that course.

k) The candidates opting for paper in guided project work shall be required to submit the project work by the time he/she takes the second semester end examinations. In the event of failures to do so or if the project work is not satisfactory he/she shall be allowed to submit/resubmit it as the case may be only once by the time the supplementary second semester end examinations are held.

l) Candidates who have failed because of failure in the second semester end examination and/or viva, shall be permitted to take a supplementary second semester-end examination/viva within four (4) weeks after the commencement of the first semester of the next academic. year.

Classification of Candidates:

The names of the successful candidates at the Bachelor of L. Sc. Degree Examination shall be arranged in the order in which they are registered for the examination in three classes on the basis of the total marks obtained by each candidate in all the courses of both the semesters and the viva put together.

I class with Distinction : Those who obtain 70% and above.

I Class : Those who obtain 60% and above but less than 70%

II Class : Those who obtain 50% and above but less than 60%

| | | |
|---|---|---|
| IV Class | : | Those who obtain 40% and above but less than 50%. |

## 2 ANNAMALAI UNIVERSITY

### B.A., B.Sc., & B.Com.

Semester system is followed in this university only at the Degree level and not at the Post Graduate Level. Each academic year shall comprise two semesters. I, III and V semester courses shall be conducted during July to November and II, IV and VI semester courses shall be conducted during December to April. The examinations for the I, III and V semesters shall be conducted in November and those for the II, IV and VI semesters in April.

20% of the marks for sessional on practical work and 80 percent of the marks for the examination shall be allotted for each paper. The concerned staff member will award the sessional mark on the basis of tests and assignments. Candidates who have secured not less than 40% of the marks including the sessional mark shall be declared to have passed the examination in that paper. All the other candidates shall be declared to have failed in that paper.

A candidate will be promoted at the end of 2nd or 4th semester only if the total number of subjects in which he has to pass at that stage is six or less.

### Award of Class

75% and above : I class with distinction

| | | |
|---|---|---|
| above 60% but below 75% | I | class |
| above 50% but below 60% | II | class |
| above 40% but below 50% | III | class |

## 3 THE M. S. UNIVERSITY OF BARODA

Semester system is in vouge in the Faculties of (i) Social Work (ii) Home Science (iii) Engineering & Technology (iv) Law (v) Education and Psychology.

### FACULTY OF SOCIAL WORK

This faculty offers two year programme of professional curriculum leading to Master's Degree in Social Work (M. S. W.). The Social Work profession demands from the student a thorough knowledge of the problems and head of the individual, groups and the society at large. He is also required to master methods and techniques found effective in solving specific problems. The training programme, accordingly consists of the following three components.

i) Class room instruction — Background courses
Method courses.
Field Courses.

ii) Field Work

iii) Research

### Attendance - (minimum)

i) An over all attendance of 80% of the number of lectures delivered and tutorials, seminars etc., arranged in all subjects provided the total attendance in each of the subject offered is at least 75% and (ii) 80% of the days allotted for field work. The field work is for 15 hrs. a week.

### Requirements for a M. S. W. Degree

i) Regular attendance in class room & field work

ii) Timely submission of various assignments and field work reports.

iii) Active participation in class room and seminar discussions

iv) Satisfactory performance in each of the class room courses and field work.

v) An acceptable research project report

vi) Successful completion of viva voce

### COURSE CONTENT FOR M.S. W.

| Term | Number of Papers | Total Hours/week | Total points |
|---|---|---|---|
| I | 6 | 12 | 12 |
| I | 1 | 1 | 1 |
| II | 5 | 10 | 10 |
| II | 3 | 3 | 3 |
| III | 4 | 8 | 8 |
| III | 2 | 2 | 2 |
| IV | 3 | 6 | 6 |
| IV | 1 | 1 | 1 |
|  | 25 | 43 | 43 |

## 2. FACULTY OF HOME SCIENCE

The faculty offers a four year degree programme. In the first three years, general programme of study is offered and in the fourth year a choice of special subject is offered.

Each course of study to be pursued for a semester or two. For each course a certain number of credits are assigned which indicate the classes perweek to be held and the number of hours of study outside the class to be devoted to the study in that course. This system of organising study is known as the semester credit system.

The number of credits allotted to courses are earned by a student or passing the course. For graduation with B. Sc. (Home) degree, a student should earn 148 credits by completing the study of the prescribed courses and by earning an overall passing grade of C.

## The Grade-Credit system of Evaluation:

Learning is tested in each course of study by the course teachers by means of periodical assignment tests and practical work done during the whole semester and by a final semester examination. Achievement is assessed using numerical or letter grades or both as thought fit by the teacher for any particular subject or the testing situations.

The level of student performance in studies is evaluated both qualitatively and quantitatively on a four point scale ranging from F to A grades:

| Category | Category Value in | | Range of category value in grade points. |
|---|---|---|---|
| | Letter grade | Grade point average | |
| Excellant | A | 3 | 2.5 - 3.0 |
| Good | B | 2 | 1.5 - 2.4 |
| Average | C | 1 | 1.0 - 1.4 |
| Fail | F | 0 | .9 and below |

To pass a course a student must earn the grade of C. To pass a semester a student must earn a minimum overall grade point of 1.00 for the pass grade of C.

## CREDIT

All courses offered in the faculty are assigned a specific number of credits; one credit in a course means one lecture of 50 minutes duration or laboratory work of 100 minutes per week in the subject throughout the semester.

The requirements for the degree of B. Sc. (Home Science) are the completion of 148 credit hours of work during 8 semesters.

## Assessment of Students:

Minimum 80% attendance is necessary for keeping in this faculty for all the courses.

## Procedure of grading

The students' performance during a semester in the subject, in practical tests, term papers, reports, class room work and special projects are graded on a 4 point scale. The average of all these grade carries 2/3 of weightage of the total grade of the semester. At the end of each semester a final examination is conducted which covers the whole course of the semester. The grade obtained for the final examination carries 1/3 weightage of the total grade of the semester.

For the final assessment of the result, the class record and examination grades will have the following weightage.

Class record - 2/3 of total grades.

Examination - 1/3 of total grades.

All the credits taken by the students during the VII and VIII semester will be considered while calculating the final class grade for B. Sc. (Home) final examination.

The overall grade assigned to a student at the end of the semester is based on the average of total point calculated on the basis of (i) the number of courses taken (ii) the number of credit point carried by each course taken and (iii) the quality points of the grade earned by the student in the course during the semester. The student's overall grade is the average of the values of these factors.

For passing at the final examination B. Sc. (Home), a candidate must obtain an overall C grade.

## 3. FACULTY OF ENGINEERING AND TECHNOLOGY

5 year Degree course in Civil, Mechanical, Electrical, Chemical and Metallurgical. Each year shall be divided into two semesters, and a candidate shall be allowed to join the II semester of the particular year irrespective of his result at first semester examination of that particular year.

To pass any examination of the I or II semester of I to IV year, a candidate must obtain 40% of the full marks in each written paper, term work and practical examination separately. To pass the I or II semester of the fifth year, a candidate must obtain 40% of full marks in each written paper term work and practical examination separately and 45 percent of the total marks obtainable

The award of class from I to IV year shall be based on the aggregate performance of a candidate in examination of both semesters of particular year.

Those of the candidates who obtain 50% or more but less than 60% of the total marks and who are otherwise not ineligible as stated above shall be placed in II class.

Those of 60% or more but less than 66% - I Class

Those of 66% or more of total marks - I Class with Distinction.

Examinations in Architecture: Each student shall have to submit a dissertation of design project on the subject chosen by him and offered by the teacher concerned, along with the drawing and details suggested by the guide.

Post Graduate (M. E.) : Attendance at the tutorial periods and tests is compulsory. The system of giving credit for work done during the terms is followed. Regular records of class work and periodical tests of the students are maintained.

Theoretical Subjects : 30 percent of the maximum marks for the examinations in the subject for degree courses & 20 percent of the maximum marks for the examination in the subject for diploma courses.

Faculty of Law: (i) The Bachelor of Law (general) course will be of two years duration consisting of 4 semesters. (ii) The Bachelor of Law (special) course will be of three years duration consisting of six semesters after graduation and will be of one year duration consisting of two semesters after L. L. B.

Examination (i) Examinastions for the I, II & III semesters of L. L. B. (general) degree and that of V semester of L. L. B.

(special) degree will be conducted by the Faculty of Law. (ii) Examination for the IV Semester of L. L. B. (general) degree and that of the VI semester of L. L. B. (Special) degree will be conducted by the university. (iii) All the above semester examinations shall be conducted twice in a year.

Standard of passing: (i) 40% of marks in each paper and 50% of the total marks for I and II/III and IV/V and VI semesters taken together, as the case may be.

Awarding of classes: Those of the candidates who pass in all the papers of the I & II/III & IV/V & VI semester examinations taken together as the case may be and obtain not less than 50% of the total marks obtainable will be placed in II class and those who obtain not less than 66% of the total marks obtainable will be placed in I class. (Standard of passing is also the same for L. L. M.).

## 5. FACULTY OF EDUCATION & PSYCHOLOGY

B. Ed. : A candidate admitted to the B.Ed. course shall undergo a regular course of study in the faculty of Education & Psychology for one year.

M. Ed. : Scheme A. Full time student - one year. The instruction time will not be less than 24 hrs. per week. Scheme B: Part time student - 2 years. The instruction time will be not less than 10 hours/week.

Scheme of Evaluation: (For both B. Ed. & M. Ed.) Every candidate must have 80% attendance in each of the courses selected by him/her.

The student's performance in every course will be judged on the basis of class room tests, term papers and assignments. At the end of each semester, a final test will be given in each of the courses taught during the semester. The final test will be based on the whole course covered during the semester. The comprehensive test in each course will have the same weightage as of internal assessment covering tests, term papers and such other sessional work. Eleven point scale will be used for grading:

| Grades | A+; | A; | A-; | B+; | B; | B-; | C+; | C; | C-; | D; | E. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Points | 10; | 9; | 8; | 7; | 6; | 5; | 4; | 3; | 2; | 1; | 0. |

The dissertations will be assessed by the guiding teacher and an external examiner. The assessment will be on the eleven point scale as mentioned above.

The board of examiners consisting of at least 2 internal and 2 external examiners to be appointed by the syndicate shall hold a viva voce test of each candidate. The viva voce test will focus on the candidate's grasp of problems of class room teaching in general and problems of his areas of specialisation in particular. The viva voce test will carry 3 credits for B. Ed. and 4 for M. Ed.

Standard of Passing: To qualify for the M.Ed. or B. Ed., a candidate must obtain (i) at least a C grade in each of the courses he/she chooses to offer. (ii) an overall grade of C+ in all the courses offered. (iii) a grade of B- in the dissertation. (iv) at least a C+ grade in the viva voce test is necessary.

The overall grade in the courses will be calculated on the basis of grade points carried by each of the courses. The student's overall grade will be the average as illustrated below: (Figs. given in brackets are for B. Ed.).

| Course for M. Ed. & B. Ed. | Credit | Grade | Grade Point | Total Points |
|---|---|---|---|---|
| M. Ed. Course 601 (501) | 2(2) | B+ | 7 | 2 x 7 = 14 |
| M. Ed. Course 606 (503) | 2(2) | B- | 5 | 2 x 5 = 10 |
| M. Ed. Course A 612 (506) | 3(1) | A- | 8 | 3 x 8 = 24<br>(1 x 8 = 8) |
| M. Ed. Course A 613 (516) | 3(4) | A | 9 | 3 x 9 = 27<br>(4 x 9 = 36) |

| | | | | |
|---|---|---|---|---|
| M. Ed. Course B 614(517) | 3(4) | B+ | 7 | 3 x 7 = 21<br>(4 x 7 = 28) |
| Ave. Gr. Pt. = $\frac{96}{13}$ = 7.4 | 13 | | 36 | 96 |

overall grade = B+.

Qualitative interpretation of grades and grade points:-

| | | | | | |
|---|---|---|---|---|---|
| 0 to 0.5 | E | Very Bad | 6.6 to 7.5 | B+ | Good High II class |
| 0.6 to 1.5 | D | Bad | 7.6 to 8.5 | A- | Very good I class |
| 1.6 to 2.5 | C- | Not Satisfactory | 8.6 to 9.5 | A | Very good I class |
| 2.6 to 3.5 | C | Fairly Satisfactory | 9.6 to 10 | A+ | Distinction |
| 3.6 to 4.5 | C+ | Satisfactory (Pass class) | | | |
| 4.6 to 5.5 | B- | Very Satisfactory (Pass class) | | | |
| 5.6 to 6.5 | B | Fairly good II class. | | | |

The overall grade in qualitative interpretation and the final grade in dissertation will be shown separately in the certificate.

The transcript shall contain details of the grades and classes A +, A, B, or C+ which will be equivalent to distinction, I, II and III class respectively.

M.A. Psychology: Duration - 2 years. There will be examination in all subjects of both part I & II at the end of each year respective part for these concerned. Each paper is assigned 100 marks, out of which 20 marks are reserved for internal assessment during the year.

Marks for practical
i) Two practicals - 70 marks
ii) Internal assessment of journals - 20 marks.
iii) Oral at practical 10 marks

Total = 100 marks

| Std. of passing:- 25% in each paper & 40% on the aggregate (at least) | II class 50% on aggregate (at least) | I class 60% on the aggregate. (at least) | Distinction 70% on the aggregate. (at least) |
|---|---|---|---|

B.A. Psychology (Special). Duration - 3 years

The candidate have to appear in one paper of basic Psychology. Besides students offering Psychology at I B.A. & also at II B.A. as a minor subject will be required to attend atleast 5 expt. s. in the laboratory. Scheme of Examination: To pass II B.A. & III B.A., candidates must obtain 40% marks in (a) compulsory english. (b) minor (subsidiary) subject (c) major (principal) subject.

Standard of passing Examination.

| | III class | II class | I class | Distinction |
|---|---|---|---|---|
| (at least) | 40% | 50% | 60% | 70% |

Internal Assessment: 30 marks for each paper are reserved for internal assessment which is based on the performance of the candidates on tests conducted during the year. The question paper at the annual examination will be for 70 marks.

## 4 UNIVERSITY OF BOMBAY

Semester system has been introduced for the following courses of this university.

1. B. E. (Civil, Mech., Electrical & Production)
2. B. Arch.
3. B. Sc. (Nursing) (Post Certificate)
4. M. Chem. Engineering & M. Sc. (Tech.)
5. D. I. I.

(This revised integrated course came into force with effect from June 1973).

### I B. E. (Civil, Mech., Electrical, Production).

A candidate will be required to pass 8/9 semester examinations. The I & II semester examination together will be called the I year Engineering Examinations. Similarly, III & IV semester II year Engineering Examination in (C, M, E, P,); V & VI -III year Engineering Examination in (C. M, E, P), (a) VII & VIII - Final year Engineering Examination for (C, M & E) and (b) VII, VIII & IX - Final year Engineering Examination for production.

Where term work is prescribed for a subject each candidate must produce a certificate from the principal of his college that he has satisfactorily completed, with in the walls of the college, a set of laboratory expts./drawing sheets/ design reports/practical jobs as required for the subject. Journals containing the record of the laboratory work/drawing sheets/ design reports/ practical jobs shall be counted as term work, which shall be submitted to the examiners and allotted marks as reserved for the term work in the subject. When once a term work has been submitted for the examination and marked that marking will be carried over to a subsequent examination unless a new term work is presented. A candidate whose marks in term work are thus carried over shall be eligible for a class. Candidates will be examined in the following manner for the semesters I to VIII.

| No. of Semester & subject | Total No. of paper | Scheme of instruction total periods per week |  | Scheme of Examination |  |  |  |  |
|---|---|---|---|---|---|---|---|---|
|  |  | Lecture | Practical | Total Marks for all papers | Term work marks Total | Total Practical marks | Total oral marks | Grade Total for each semester. |
| CMEP |  |  |  |  |  |  |  |  |
| I | 7 | 22 | 18 | 500 | 250 | - | - | 750 |
| II | 7 | 23 | 17 | 500 | 200 | - | - | 700 |
| CIVIL |  |  |  |  |  |  |  |  |
| III | 8 | 28 | 14 | 600 | 225 | - | - | 825 |
| IV | 7 | 28 | 16 | 625 | 200 | 50 | 100 | 975 |
| V | 7 | 25 | 17 | 575 | 175 | - | - | 750 |
| VI | 7 | 28 | 17 | 625 | 225 | 50 | 150 | 1050 |
| VII | 5 | 23 | 16 | 400 | 250 | - | - | 650 |
| VIII | 5 | 23 | 22 | 400 | 250 | - | 150 | 800 |
| MECH |  |  |  |  |  |  |  |  |
| III | 7 | 23 | 18 | 575 | 200 | 50 | - | 825 |
| IV | 7 | 26 | 15 | 575 | 150 | 50 | - | 775 |
| V | 7 | 27 | 16 | 600 | 200 | - | - | 800 |
| VI | 6 | 25 | 13 | 525 | 150 | 150 | 100 | 925 |
| VII | 5 | 24 | 13 | 500 | 200 | - | - | 700 |
| VIII | 4 | 14 | 24 | 300 | 200 | - | 200 | 700 |
| ELECT. |  |  |  |  |  |  |  |  |
| III | 6 | 20 | 16 | 500 | 175 | - | - | 675 |
| IV | 6 | 22 | 15 | 500 | 175 | - | - | 675 |
| V | 6 | 26 | 14 | 500 | 150 | - | - | 650 |
| VI | 6 | 28 | 10 | 525 | 75 | 100 | - | 700 |
| VII | 5 | 25 | 9 | 500 | 150 | - | - | 650 |
| VIII | 4 | 15 | 18 | 300 | 150 | - | 100 | 550 |

Standard for passing the examinations: B. E. (C, M, E, P)

To pass the examination a candidate must obtain a minimum of 40% of the full marks in each of the subjects.

A minimum of 40% must be obtained in the written examinations, term work and practical examination separately in each subject. Those of the successful candidates who obtain 50% of the total marks obtainable in both semesters of III & IV, V & VI and VII & VIII examinations taken together will be deemed to have passed the examination with II class honours.

Those who obtain 60% of the total marks obtainable in semesters as mentioned above will be deemed to have passed the examination with first class honours.

Those who are placed in I class & have obtained 70% of the total marks obtainable in semester as mentioned above will be deemed to have passed with Distinction. The names of the candidates who pass with Honours, who are placed in the I class or I class with Distinction shall be arranged in order of merit.

(This revised course came into force with effect from June 1974).

II. B.Arch.) Bachelor of Architecture.

The course leading to B.Arch. shall be a full time course comprising eleven semesters, each semester of the duration of one academic term. There will be an examination at the end of each semester, A candidate for the degree of B.Arch. examination will be required to pass all the eleven semester examinations:

i) I & II semester Examination together will be called the I year Examination.

ii) The III & IV Examination together will be called the II year Examination.

iii) The V & VI Examination together will be called the III year examination.

iv) The VII & VIII Examination together will be called the IV year examination.

v) The IX semester examination in Arch. shall be a viva voce to test the candidate in the practical experience he has gained during the period of his training for semester IX and it will be called as pre final year.

vi) The X & XI semester Examination together will be called the final year Examinations

The degree of B. Arch. will not be conferred upon a candidate unless the candidate has passed in all the papers and sessional work prescribed for each semester examination. In accordance with the provisions relating to each semester examinations.

The marks obtained for the sessional work will be based on the candidates day to day work and/or his performance at the various periodic tests. Once the sessional work to a candidate has been submitted for examination and marked, the said marks will be carried over to a subsequent examination unless a fresh sessional work is presented by the candidate. A candidate whose marks in sessional work are thus carried over shall be eligible for a class.

On satisfactory completion of the IX semester i. e. professional experience, a candidate shall be required to submit a report through the employer, based on the professional experience undergone during the period of training.

The employer shall forward a certificate to the effect that the candidate has gained professional experience as laid down by the university, on receipt of the report of the candidate and the employer's certificate on the professional experience gained by the candidate, the professor in-charge shall assess the performance of the candidate on the basis of the work done and the discipline maintained during the period of training. A viva-voce will be conducted jointly at the end of semester IX by the panel of examiners, viz; an internal examiner and an external examiner appointed by the university for the purpose.

Standard of passing the Examination:- Same as the one given for B. E. (C, M, E, P)

## III B. Sc. (Nursing) (Post Certificate) year of introduction of the course June 1974

The course of study for the degree of B. Sc. (Nursing) (P. C.) shall be a full time course extending over a period of four semesters (two academic years) - A candidate will be required to pass four semester examinations. The I & II semesters together will be called I year Examination and the III & IV semesters together will be called the II or final year Examination for the degree of B. Sc. (N)(P. C.)

Candidates will be examined in the following subjects for semester 1 to 4

| No. | Subject | Duration in hrs. | Marks | Semester work |
|---|---|---|---|---|
| | SEMESTER I | | | |
| 1. | English (subsidiary) | $1\frac{1}{2}$ | 50 | 25 |
| 2. | Physics (subsidiary) | $1\frac{1}{2}$ | 50 | 25 |
| 3. | Chemistry (subsidiary) | $1\frac{1}{2}$ | 50 | 25 |
| 4. | Biology (subsidiary) | $1\frac{1}{2}$ | 50 | 25 |
| 5. | (Principal) Paper I | $1\frac{1}{2}$ | 50 | 50 |
| 6 | (Principal) Paper II | $1\frac{1}{2}$ | 50 | 50 |
| 7 | Paper III (Principal) | $1\frac{1}{2}$ | 50 | 25 |
| | SEMESTER II | | | |
| 1. | Paper IV (Principal) | 2 | 75 | 25 |
| 2. | Paper V (Principal) | 2 | 75 | 25 |
| 3. | Paper VI (Principal) | 3 | 100 | 100 |
| 4. | Paper VII (Principal) | 3 | 100 | 100 |

| | | | | |
|---|---|---|---|---|
| 5. | Gl. Psycho (Subs.) | 1½ | 50 | 25 |
| 6. | Sociology (Subs.) | 1½ | 50 | 25 |
| | SEMESTER III | | | |
| 1. | Paper VIII (Principal) | 3 | 100 | 100 |
| 2. | Paper IX (Principal | 3 | 100 | 100 |
| 3. | Paper X (Principal) | 2 | 75 | 25 |
| 4. | Education Psycho. (Subs.) | 1½ | 50 | 25 |
| 5. | Abnormal Psychology (Subs.) | 1½ | 50 | - |
| | SEMESTER IV | | | |
| 1. | Paper XI (Principal) | 3 | 100 | 100 |
| 2. | Paper XII (Principal) | 3 | 100 | 100 |
| 3. | G.W. (Subs.) | 1½ | 50 | 50 |
| 4. | (Subsidiary) | - | - | 50 |
| 5. | (Subsidiary) | - | - | 50 |
| 6. | (Subsidiary) | - | - | 50 |

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## Standard of Passing the Examination

a) To pass the examination, a candidate shall obtain 35% marks in theory and semester work taken together in each of the subsidiary subjects of English.

b) 30% of the fullmarks in the subsidiary subject of English, and

c) 50% in theory and semester work taken in each of the principal subjects.

Those of the successful candidates who obtained 35% (45%) of the total on the aggregate of the subsidiary subjects and 50% (60%) of the total on the aggregate of the principal subjects of the four semesters having passed each semester examination at one and the same sitting will be considered to have passed the examinations in the second class. Those who obtain the marks given above in the brackets will be considered to have passed the examination in the I class.

Those of the successful candidates who pass the examination in the I class & obtain 70% marks in any principal subject (Theory and semester work taken together) will be declared to have passed with distinction in that subject or subjects. The names of the successful candidates who pass the examination in the I class will be arranged in order of merit.

All successful candidates other than those who have passed the examination in the I Or II class will be placed in the pass class. Candidates passing the examination in compartments will not be eligible for a class or for any prize or scholarships to be awarded at the examination.

## IV Master of Chemical Engineering (M.Chem. Engg.) and Master of Science (Technology) M. Sc. (Tech.)

**This course came into force with effect from Ist August, 1973. The duration is one year i. e. 2 semesters. The examination for the degree of M. Chemical Engineering & M. Sc. (Tech.) will be held in two parts. (i) a theory examination and (ii) a thesis to be submitted.**

**(i) Theory Examination: Every Candidate registered for the degree of M. Chem. Engg. & M. Sc. (Tech.) shall be required to pass a theory examination which will be held in two parts. Part I - to be called herein after as semester I examination; and part II as semester II examination. The semester I examination will be held in December only every year and semester II examination in April only every year. In the subjects in the following manner.**

| Semester | No. of Paper | Duration of each Examination in Hours. | Total marks for each paper. |
|---|---|---|---|
| I | 5 | 2 | 50 |
| II | 5 | 2 | 50 |

To pass the semester I & II examination a candidate must obtain at least 40% of the marks in each subject head at each of the semester examination, at least 50% of the marks assigned to the subject head "Seminar" at the semester II examination and, in addition, he must obtain at least 50% of the total number of marks assigned to each of the semester examination.

(ii) Thesis: Every candidate registered for the degree of M. Chem. Engg. shall be required to carry out a research or a design project to be assigned by one or more of the teachers in the department under the supervision and guidance of a recognized university teacher. The research/design project shall be assigned not later than the end of the I term. Three type-written copies of the thesis embodying the result of the research/design project, ordinarily not exceeding 100 pages, together with a synopsis and a statement indicating to what extent his work is original and to what extent it is borrowed from others, shall be submitted by the candidate to the Registrar of the university through his guiding teacher.

The thesis shall be referred for examination and report to 2 referees to be appointed by the syndicate, on the recommendation of the Board of studies in the field of study and the Academic Council, one of the referees being always the guiding teacher. The referees shall jointly hold a viva-voce examination of the candidate to test his knowledge of the subject of the thesis. The viva-voce examination shall be held only after the thesis has been valued by all the referees and at the time of holding it, the referees conducting the viva-voce shall have the thesis in their hands. The referees to whom the thesis is referred for examination and report shall, after valuing the thesis and holding a viva-voce examination report to the syndicate whether the thesis shall be accepted or rejected and their report shall be final.

Where there is a difference of opinion between them, the syndicate shall appoint a third referee and shall decide whether the degree is to be conferred or not after consulting the reports of all the 3 referees. All reports shall be circulated to the members of the Board of studies and placed before the Academic Council for information.

The thesis accepted for the degree shall be given a grade namely 'A' (very good), or 'B' (Satisfactory). The grade to be awarded shall be decided by the referees valuing the thesis depending on the quality and the presentation of the research work. A mention of the grade so awarded shall be made in the result of the examination.

Successful candidates shall be awarded classes, as under jointly on the basis of the result of the semester I and II examinations and the thesis submitted by them.

| | | |
|---|---|---|
| i) | Those obtaining 65% or more of the grand total at both the semester I & II examination taken together and grade A in the thesis | I class with distinction |
| ii) | Those obtaining 65% or more of the grand total at both the semester I & II examination taken together and grade 'B' in thesis | I class |
| iii) | Those obtaining 55% or more of the grand total at both the semester I & II examination taken together and grade A in the thesis | I class |
| iv) | All other cases | II class |

A thesis that has been rejected may be submitted again after due revision and payment of a fresh fee.

## 5 UNIVERSITY OF CALICUT

Semester system is not followed in this university in all the faculties except in the Faculty of Engineering and Technology for the under graduate level.

Duration of the course: The course for the B. Sc. (Engg.) Degree shall extend over a period of four academic years comprising eight semesters each of 450 working hours (75 working days of 6 hours each) which shall cover the group of subjects specified for each semester. The course work of every semester shall be followed by a preparation period of two weeks before the commencement of the examinations. The examinations (both theory and practical) should normally be spread over a period of three working weeks. The dates of commencement of semesters and examinations will be fixed by the University in consultation with the principals of engineering colleges.

Branches of Study: The subjects for the first two semester are common for all branches of study. Commencing with III semester a candidate may select any one of the following branches of study and such other branches of study as may be instituted from time to time.

| | | |
|---|---|---|
| Branch | I | Civil Engineering |
| Branch | II | Mechanical Engineering |
| Branch | III | Electrical Engineering |
| Branch | IV | Chemical Engineering |

Subject of Study: The courses in each branch of study shall comprise both theory and practical and shall be in accordance with the scheme and syllabi prescribed.

Electives: All students shall, on commencement of V Semester choose a stream of electives comparising four subjects offered during the V, VI, VII and VIII Semesters.

Examination: There shall be university examinations at the end of every semester in subjects as prescribed under the respective scheme of examinations.

Examinations in the various subjects of I, III, V & VII semesters will be conducted simultaneously. Examination in the various subjects of II, IV, VI & VIII semesters will be conducted simultaneously. These 2 groups of examination shall be conducted on alternate days. Examinations of two successive semester will not be conducted on the same day. The examinations in various theory subjects for semester shall ordinarily be held in the order given in the scheme of examinations.

Promotion to the higher semester shall be regulated as under:

All candidates shall be admitted to II semester irrespective of the results of the I semester examinations. Candidates shall not be admitted to $n^{th}$ semester unless they have passed the $(n-2)^{th}$ Semester examination.

However, a candidate shall be promoted to the $n^{th}$ semester if he has passed all the papers of the (n-1)th semester and has only one paper in the (n-2)th semester. If the paper to be cleared in the (n-2)th semester is a theory paper, the candidate may have to drop one theory paper of the $n^{th}$ semester in order to clear the arrear paper of the (n-2)th semester. Such a candidate shall be promoted to the (n+1)th semester only if he clears the arrear paper of the (n-2)th semester.

Curriculum and Scheme of Examinations: The curriculum and scheme of examinations in different semesters shall be as given elsewhere.

Passing Minimum and Classification of the Successful Candidates: A candidate who secures not less than 50% marks in a subject at the university examination shall be declared to have passed the examination in that subject. A candidate who secures not less than 40% marks in a subject and not less than 50% of the total marks assigned to the subject, which includes the marks assigned to university examination and sessional assessment, shall also be declared to have passed the examination in that subject.

i) A candidate who qualifies for the Degree, passing all the subjects of the eight semesters within four academic years after the commencement of his course of study and secures not less than 70% of the aggregate of total marks assigned to the university examinations of the last six semesters and 33$\frac{1}{3}$ of total marks assigned to the sessional evaluation of the last six semesters, shall be declared to have passed the B. Sc. (Engg.) degree examination in first class with Honours.

ii) Not less than 60% -I class

iii) All other successful candidates shall be declared to have passed the examinations for the degree in second class.

## 6 UNIVERSITY OF DELHI

Semester system is not followed in all faculties at the under graduate level. It is followed only in the case of B. Sc. (Electrical/Mech. /Civil) Engineering courses under the faculty of Technology.

Details from the copy of Semester Scheme of Examination are given below: (B. Sc.) Tech. only.

| | | |
|---|---|---|
| Examination -I | Parts I & II common to all (Elect. /Mech. /Civil) Engineering. | |
| Examination -II | Electrical Engineering | Part I & II |
| | Mechanical Engineering | Part I & II |
| | Civil Engineering | Part I & II |
| Examination- III | Electrical Engineering | Part I & II |
| | Mechanical Engineering | Part I & II |
| | Civil Engineering | Part I & II |
| Examination - IV | Electrical Engineering | Part I Only |

| | | |
|---|---|---|
| | Mechanical Engineering | Part I Only |
| | Civil Engineering | Part I Only |
| Examination -V (Or) Final | Electrical Engineering | Part I with an Electronics group. |
| | | Part II with an Electronics group. |
| | Mechanical Engineering | Part I & II |
| | Civil Engineering | Part I & II |

Information regarding the Examination alone is given. Details regarding the duration, marks etc., are not given and semester system is not followed at post graduate level.

## 7. GARHWAL UNIVERSITY

This university has not yet introduced the semester system in any of its courses, except L. L. B. (3 years) course. The examination for the degree of L. L. B. shall consist of six semester examinations. A student clearing all the six semesters shall be conferred with the degree of L. L. B. A candidate shall be required to obtain at least 36% marks in each course and 48% marks in the aggregate of all courses. The division shall be awarded on the basis of the following percentage of the aggregate of the maximum marks.

First division 60% or above; second division 48% or above, but below 60%. The division for the degree of L. L. B. will be awarded on the percentage of the aggregate marks of all the six semester courses prescribed for the degree. A candidate who does not earn the L. L. B. degree in four years shall not be entitled to be a candidate for the degree unless the Vice-chancellor permits him to continue his studies beyond the specified period. In no case, the extension shall be beyond five years.

Scheme of Examinations: There shall be six examinations, one at the end of each semester. There are three papers for each semester examination and the total number of papers being eighteen.

## 8 GURU NANAK DEV UNIVERSITY

In Gurunanak University, semester system is followed in the faculty of science only at under graduate B. Sc. (Hons.) and post graduate M. Sc. (Hons.) level, that too for some specific subjects.

| | Name of the course | Duration of the course | Semester/ year | |
|---|---|---|---|---|
| | Under Graduate Level | | | |
| 1. | a. B. Sc. (Hons.) School in Chemistry | 3 years | I<br>II | I year |
| | b. B. Sc. (Hons.) School in Biology | 3 years | III<br>IV | II year |
| | | | V<br>VI | III year |
| | Post Graduate Level | | | |
| 2. | a. M. Sc. (Hons.) School in Chemistry | One year | I<br>II | I year |
| | b. M. Sc. (Hons.) School in Biology | One year | I<br>II | I year |
| 3. | a. M. Sc. Instrumental analysis | Two years | I<br>II | I year |
| | b. M. Sc. Oils, Soaps and Detergents | | III<br>IV | II year |

| | | | | |
|---|---|---|---|---|
| 4. | M. Phil in Psychology English, Hindi, History Pol. Science, Panjabi, Economics, Biology, Chemistry and Mathematics (for regular teachers only) | One year | I<br>II | I year |
| | **Laws** | | I<br>II | I year |
| 5. | (L. L. B. Professional) | 3 years | III<br>IV | II year |
| | | | V<br>VI | III year |
| 6. | a. Diploma in Labour Laws & Labour Administration | One year | I | I year |
| | b. Diploma courses in Taxation Laws and Labour Administration | One year | II | |
| 7 | Master's Degree Course in City and Regional Planning (M. C. R. P.) | Two Years | I<br>II | I year |
| | | | III<br>IV | II year |

It is also learnt that the Departments of Economics, Psychology and Sociology have introduced semester system with effect from admissions in 1976

## 9 UNIVERSITY OF INDORE

In this university, semester system is followed in the following faculties (i) Faculty of Engineering (ii) Faculty of Commerce.

I. Faculty of Engineering

B. E. : (Civil, Mech., Elect. & Electronics)

(Regular 5 Y. D. C.) - 10 semesters

One academic year is divided into two semesters and exam. is held twice a year i. e. in November and May).

2. B. E. (P. T. D. C.) part time - 8 semesters

   (4 years)Civil, Elect., Mech.

3. M. E. (Civil, Mech., Elect.) - 4 semesters

   (2 years)

4. M. Sc. (applied) Physics - 4 semesters

   (2 years) Chemistry & Maths.

There will be a university examination in all subjects at the end of each semester. Candidates who start the sections in November/December shall have their academic year with Ist semester from November/December and II semester from June/July.

In order to pass examination for any semester, a candidate must obtain at least (i) 35% of the full marks in theory papers (ii) 60% of the full marks in sessional (iii) 60% in class work (iv) 50% of the full marks in practical. The aggregate of 3rd, 4th & 5th year will be added together for purpose of award of division in the degree and the division will be awarded as follows: (Aggregate means the total of all the marks obtained by the candidates in group A & group B). (a) candidates securing 75% or more marks in combined aggregate of III IV & V year examination: I class with distinction (b) 65% - 74% I division (c) Below 65%-II Division.

II. Faculty of Commerce: M. B.A.

The part time 3 year M. B.A. programme shall consists of 6 semesters and there shall be a university examination at the end of each semester.

A candidate shall be eligible to appear in the succeeding semester examination only after having passed the preceeding semester examination. Examination in each paper shall be of

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3 hours' duration.

Candidates shall have to pass separately in the university examination & internal assessment.

For passing each semester examination the candidate shall be required to secure at least 36% marks in each paper of the university examination & 40% marks in internal assessment separately, with atleast 48% marks in the aggregate.

Candidates shall be awarded division after having duly passed all the 6 semester Examinations & internal assessment on the basis of the aggregate marks obtained in all the 6 semester examinations & all the internal assessment. The division shall be awarded as follows:

I division 60% or above

II division 48% or above but less than 60% of aggregate.

## 10. JAWAHARLAL NEHRU UNIVERSITY

The curricular work leading to the award of Master's degree shall be spread over a minimum of 10 semesters - five Monsoon Semesters and five Winter Semesters.

Provided that Curricular work leading to the award of the Master's degree shall be spread over a maximum of 8 semesters-4 Monsoon Semesters and 4 Winter Semesters, and a minimum of 4 Semesters - 2 Monsoon Semesters and 2 Winter Semesters.

The Monsoon and the Winter Semesters shall commence from and end on dates to be fixed by the Academic Council:

Provided that each semester shall ordinarily have 90 working days excluding the examination days.

A student who has taken the required curricular programme for a minimum of six semesters will become eligible subject to regulations made in this regard for the award of B.A. (Hons.)

B.A. (Pass) degree of the University, provided he fulfils the credit requirements and grade requirements.

There shall be three levels of courses:

(i) 'C' level courses which will be given ordinarily in the first two semesters.

(ii) 'B' level courses which will ordinarily be given in the third fourth, fifth and sixth semesters.

(iii) 'A' level Courses which will ordinarily be given in the seventh, eighth, ninth and tenth semesters.

Ordinarily a course shall be given in three/four contact hours a week and the credits for these courses shall be as follows:

| | | |
|---|---|---|
| 'C' | level courses | 2 credits |
| 'B' | level courses | 3 credits |
| 'A' | level courses | 4 credits |

Provided that the Board may, on the recommendation of the Centre allot less or more credits to a particular course.

The actual credit requirements in the case of a student or a group of students for M.A. degree shall be prescribed by the Centre concerned:

Provided that it shall not be less than 144 credits in the case of Social Sciences and not less than 164 credits in the case of Languages:

Provided that the total credits earned shall include the minimum of 20 from 'C' level, 60 from 'B' level and 64 from 'A' level courses in Social Sciences and minimum of 28 from 'C' level, 72 from 'B' level and 64 from 'A' level courses in languages.

A normal load of a student in the first two semesters would be of 10 credits, in the 3rd to 6th semesters 15 credits and in the 7th to 10th semesters 16 credits in the case of social sciences; and 14 credits in the first two semesters, 18 credits in the 3rd to 6th semesters and 16 credits in the 7th to 10th semesters in the case of Languages.

The courses on the basis of which the student earns his 'C' level credits shall be at least from three disciplines.

A student shall be required to earn atleast a minimum of 10 credits from courses in tools, techniques and methodology which will be prescribed by the centre concerned.

Students shall be required to earn a minimum of six credits from courses in the field of Natural Sciences and the Impact of Science on Society; provided that till such courses are approved by the Board of the school, this clause shall not apply.

A student shall not be permitted to offer a course, if he has not previously cleared a course, which is prescribed as a pre-requisite for the former.

Students who are admitted to the seventh semester of the 10 Semester integrated course shall be required to earn a minimum of 64 credits and also to clear two extra non-credit courses;

Provided that the requirement of clearing two extra non-credit courses may be relaxed by Board of the School in the case of a student on a group of students.

A student supplicating for the B.A. (Hons)/B.A. (Pass) degree of the university under clause 6.3 shall be required to secure a minimum of 20 'C' level credits and a minimum of 66 'B' level credits in the case of Social Sciences and 28 'C' level credits and a minimum of 72 'B' level credits in the case of Languages.

Provided that the above amendments would be made applicable to the batches of students who have joined a full-time course of study in the School of Languages under the aforesaid Ordinances on or after July, 1972, on the condition that all students of the respective batches for the years 1972-73 and 1973-74 give a declaration in writing to the effect on the prescribed form that they voluntarily agree to be governed by the amended clauses of the said Ordinance:

Provided further that if any single student of the respective batch given a declaration declining to be governed by the above-amended clauses of the said ordinances;these ordinances then shall not apply to that particular batch of students and they would continue to be governed by the existing clauses so far as these were in force at the time of their admission.

## Evaluation

The system of evaluation for each course shall be laid down by the Board of the School on the recommendation of the Centre concerned.

For courses having a semester examination, sessional work shall carry the same weight as the semester examination.

The pattern and schedule of sessional work for each course of a semester shall be prescribed by the Board of the School.,on the recommendation of the centre concerned, and shall be made known to the students at the commencement of each semester.

The students would be graded in each course on a 10-point scale, that is:

| Grade | Numerical Value |
|---|---|
| A+ | 9 |
| A | 8 |
| A- | 7 |
| B+ | 6 |
| B | 5 |
| B- | 4 |
| C+ | 3 |
| C | 2 |
| C- | 1 |
| F | 0 (Fail) |

A student who fails in a Course will be required either to repeat that course or to clear another course in lieu thereof.

Explanation: A student shall be required to repeat a course or clear another course in lieu thereof irrespective of his past performance in the sessionals if he has been awarded a final weighted grade of 'F' in that course.

A student who secures a grade higher than 'F' in a course may be permitted by the Centre to improve his grade by reporting that course once:

Provided further that when a student repeats a course in the event of failure or with a view to improving his performance, the grade awarded in the latter of the two performances will be taken into account for computing the Semester Grade Point Average and the Cumulative Grade Point Average. His transcript will however, reflect appropriately both the performances and the the fact that he had repeated the same course/courses.

## 2. Grade Point Requirements/Minimum Standard

A student will be required to maintain a minimum cumulative grade point average of 2.0 during the first two semesters of the Ten-Semester Integrated Course.

At the end of the sixth semestor, a student is required to have a cumulative index grade point average of 4.0 to enable him to continue further in the programme loading to the M.A. Course.

A student who wants to discontinue the programme and has a minimum index of 4.0 or more will be considered for the award of B.A. (Hons.) Degree provided he fulfils the credit requirements as prescribed.

If a student has a cumulative index equal to or greater than 3.0 but less than 4.0 he will be considered for the award of a B.A. Pass Degree and shall be asked to discontinue from the Programme.

A student with a cumulative index of less than 4.0 at the end of sixth semester, will be given a maximum of two more semesters to bring up his cumulative index to the prescribed requirements of either the B.A. Pass or B.A. (Honours) degree or for continuing in the ten-semester Programme of study leading to M.A. Degree.

**A student in order to be eligible for the award of Master of Arts Degree** of the University must have a minimum Cumulative Grade Point Average of 4. 0.

## 11. UNIVERSITY OF JODHPUR

Semester system is followed only in the Faculty of Engineering B. E. The courses of study shall extend over a period of 5 years as an integrated course.

Every academic year except the final year shall be divided into 2 semesters.

The examination shall be conducted by means of written papers & practicals and viva voce examination including sessional work done in college labs., workshops, factories, mines and engineering works.

### AWARD OF DIVISION

For students admitted in 1973 & 1974

| | | |
|---|---|---|
| I | B. E. - | 50% of marks secured |
| II | B. E. - | 50% of marks secured |
| III | B. E. - | 100% of marks secured |
| IV | B. E. - | 100% of marks secured |
| V | B. E. - | 100% of marks secured |

For students admitted in 1973 & 74 & 1975.

| | | |
|---|---|---|
| I | B. E. | 10% |
| II | B. E. | 20% |
| III | B. E. | 40% |
| IV | B. E. | 60% |
| V | B. E. | 100% |

A degree with Honours if he secures a minimum of 70% of the aggregate marks.

| | | |
|---|---|---|
| I | Class | 60% minimum |
| II | Class | 50% minimum. The rest of the successful candidates will be awarded pass class. |

## 12. KURUKSHETRA UNIVERSITY

Semester system is not followed in the faculties of science, Arts . . . etc., in the under graduate and post graduate levels except in Five-Year B. Sc. (Engg.) Degree Course. Each Academic year is divided into two semesters and each semester is extended to about 17 weeks' duration.

## 13. UNIVERSITY OF MADRAS

### Information on the Semester System

### A. Courses

Semester System has been introduced in the following courses.

| Course | |
|---|---|
| **Faculty of Arts.** | |
| B.A. (Tamil, English, Philosophy, History and Economics) | 1976-77 |
| B.A. Other branches | 1977-78 |
| M.A. Majority of Branches (Grading scheme) | 1976-77 |
| M.A. Co-operation, Defence Studies (Grading scheme) Andragogy | 1977-78 |
| **Faculty of Science** | |
| B. Sc. Majority of branches | 1976-77 |
| B. Sc. Geology and Geography | 1977-78 |
| M. Sc. i) Chemistry | 1974-75 |
| ii) Physics, Botany, Zoology, | |

| | |
|---|---|
| Geography and Home Science | 1975-76 |
| iii) All branches with grading scheme | 1976-77 |
| **Faculty of Commerce** | |
| B. Com. | 1976-77 |
| M. Com. (grading scheme) | 1976-77 |
| **Faculty of Engineering** | |
| B. E. (Full time) | 1968-69 |
| B. E. (Part time) | 1971-72 |
| M. Sc. (Engg.) | 1971-72 |
| B. Sc. (Applied Sciences) | 1971-72 |
| M. Sc. (Applied Sciences) | 1975-76 |
| B. Tech. Ed. | 1974-75 |
| P. G. Diploma in Traffic Engg. | 1974-75 |
| M. Sc. Urban Engg. | 1974-75 |
| **Faculty of Medicine** | |
| B. Sc. in Medical Lab. Technology | 1975-76 |
| B. Sc. in Nursing | 1977-78 |
| M. Sc. Nursing (Grading scheme) | 1969-70 |
| **Faculty of Management Sciences** | |
| M. M. S. full time and part time | 1971-72 |
| **Faculty of Law** | |
| B. G. L. | 1977-78 |
| M. L. (grading scheme) | 1977-78 |
| **Faculty of Education** | |
| B. Ed. (grading scheme) | 1977-78 |
| M. Ed. (grading scheme) | 1977-78 |
| **Faculty of Physical Education** | |
| B. P. Ed. | 1977-78 |
| M. P. Ed. | 1977-78 |
| **Faculty of Lib. Science** | |
| B. Lib. Sc. | 1977-78 |
| M. Lib. Sc. (grading scheme) | 1977-78 |

## B. Content

In each Semester, certain unit subject courses are covered For each unit course, there is University examination at the end of the semester and during the course, there is internal assessment of the performance of students based on tests, seminars, assignments etc. The weightage for internal assessment has been increased to 40% from 1977-78. There is no credit system at present but some amount of flexibility with regard to combination of unit courses is available in the introduction of suitable ancillary/elective courses in each Branch. It has been decided to introduce credit system from 1978-79 for Science Courses at P.G. level run by the University Departments and the Boards of Studies have been requested to plan the course organisation.

## C. Evaluation

### Internal assessment

Internal assessment has been adopted for all semesterised courses. The following break-up of marks is followed:

| | | |
|---|---|---|
| a) | Attendance | 25% |
| b) | Behaviour | 5% |
| c) | Sessional assessment based on continuous evaluation (which includes tests, quizzes, assignments, seminars etc.) | 70% |
| | Total | 100% |

For Community Social Service which forms an integral part of the Curriculum in U.G. and P.G. courses from 1976-77, assessment is entirely internal based on continuous evaluation.

The University has provided for an Appeals Committee in each College to hear any appeal preferred by Students under Semester system against internal assessment in respect of their performances in each semester. The Committee consists of three members - Principal of the College as Convener, the Head of the Department concerned and an expert in the subject invited from a local college or a college nearby.

## 2. External Examination

The question papers have been restructured in most of the courses to include 3 sections as follows:

| | |
|---|---|
| Section A | Consisting of objective type and short answer type questions. |
| Section B | Consisting of medium answer type questions. |
| Section C | Consisting of long answer type questions (Essay/Problem solving type) |

The extent of choice of questions has been reduced to 25% in restructured papers. There is a proposal to remove choice altogether from Sections A and B, and allow for only internal choice in Section C.

## 3. Marking/Grading system

Grading system on a 7 point scale has been adopted for P.G. Courses from 1976-77. Internal assessment marks (at U.G. level and grades (at P.G. level) are shown separately.

At the U.G. level, a minimum of 35% marks in the University examination and 40% in the aggregate of University examination and internal assessment are prescribed for a pass in each paper. For a pass in the whole examination (or Parts), a minimum of 40% marks in the aggregate is prescribed. Classification of candidates (I and II and III Class) is based on aggregate marks.

At P.G. level, a minimum of 'D' grade in University examination and a weighted grade 'C' combining University examination and internal assessment grades are prescribed for a pass in each paper.

The overall performance in a course will be given in terms of grades, based on G.P.A.

## 14 MADURAI UNIVERSITY

Note: Semester system was introduced at the U.G. Level in 17 colleges during the academic year 1975-76.

During 1976-77 and 1977-78, this system was extended to 31 and 24 more colleges respectively. Of the total number of 80 arts & science colleges in the university, the semester system has been introduced in 72 colleges at the U.G. Level.

### INTRODUCTION:

One of the heard criticism about our education is that it is too heavily examination oriented, held once a year. This leaves the rest of the year without any kind of student-teacher interaction. Curriculum reform and examination reform go together. The introduction of the semester system gives us an opportunity:

a. to teach a limited portion of a syllabus in depth

b. to assess the students continuously and

c. to develop educational objectives, namely knowledge, understanding, application and synthesis.

### RULES

A semester is a period of 90 working days beginning generally from the 2nd week of June and ending with the 2nd week of October and again from the 3rd week of November and ending with the 3rd week of March. There shall be 30 hours of work per week. The distribution of hours of work per week will be as follows:

### (SEMESTER SYSTEM)

B.A./B.Sc.

| | Semester I & II | | Semester III & IV | | Semester V & VI |
|---|---|---|---|---|---|
| Part I-Language | 6 | (5+1) | 6 | (5+1) | - - |
| Part II-English | 6 | (5+1) | 6 | (5+1) | -- |
| | 12 | | 12 | | |

## Part III - Major subjects

1. Language

| | | | |
|---|---|---|---|
| Lectures | 16 | 16 | 26 |
| Seminars/Field work | 2 | 2 | 4 |
| | 18 | 18 | 30 |

2. Humanities

| | | | |
|---|---|---|---|
| Lectures | 10 | 10 | 26 |
| Seminars/Field work | 2 | 2 | 4 |
| Ancillary | 6 | 6 | - |
| | 18 | 18 | 30 |

3. Science subjects:

(a) Mathematics

| | | | |
|---|---|---|---|
| Lectures | 15 | 10 | 10 (10+2+6) |
| Seminars/Field work | 3 | 2 | 2 |
| Ancillary | - | 6 | 18 |
| | 18 | 18 | 30 |

(b) Other Science Subjects

| | | | |
|---|---|---|---|
| Lectures | 9 | 4 | 12 |
| Practicals | 3 | 2 | 8 |
| Seminars/Field work | 4+2 | 4+2+4+2 | 4+2+4 |
| | 18 | 18 | 30 |

B. Com.

Part I

| | | | |
|---|---|---|---|
| i) Language<br>or | -- | 5+1 | -- |
| ii) Alternative subjects | -- | 6 | -- |

| | | | |
|---|---|---|---|
| **Part II-English** | 5+1 | -- | -- |
| **Part III-subjects** | | | |
| Lectures | 22 | 22 | 26 |
| Seminar | 2 | 2 | 4 |

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B. B.A.

| | | | |
|---|---|---|---|
| Business Communication and Reports | 4+1 | 4+1 | -- |
| Subjects: | | | |
| i) Lectures | 23 | 23 | 26 |
| ii) Seminar/Field work | 2 | 2 | 4 |

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## EVALUATION

1. Evaluation shall be by both external and internal assessments.
2. The ratio between the external and internal assessment shall ordinarily be 75:25 for theory papers and 50:50 for practical work.
3. There shall be an external examination conducted by the University at the end of each semester.
4. The question paper for the written test should contain not only knowledge (information based) questions but also questions on comprehension, application, analysis and other higher order objectives. Short answer type questions and problem oriented questions should be given, in addition to the usual essay type questions. While there will be no choice offered for short-answer type questions, only internal choice will be offered for other types of question.
5. There shall be a separate minimum of 35% for the external evaluation and a minimum of 35% in the aggregate of both internal and external evaluations for a pass, for each theory paper.

6. Similarly, there shall be a separate minimum of 35% for a pass for each practical examination in the aggregate of both internal and external evaluation.

7. There will be no supplemental examination for the failed students under the semester system (i. e.) if a candidate fails in a paper (s) of November semester examination he will have to reappear in that paper (s) in the next November examination for obtaining a pass. Similarly if a candidate fails in a paper (s) of April semester examination, he will have to reappear in that paper (s) in the next April examination.

8. Failed candidates will be permitted to appear under the same text-books and syllabus for 3 attempts in successive years including the first. Thereafter they shall appear under the new syllabus.

Parts I, II and III shall keep the same text-books and syllabuses for atleast two years, so that there shall not be more than two sets of question papers at any one time.

9. If a candidate fails in the theory paper in a major or ancillary subject and passes in the practical in a particular semester, he has to reappear only for the theory paper and he will be given a pass certificate as regards the practical and vice-versa.

10. If a student is registered for the University examination but is absent, his marks in the external examination shall be taken as zero and the result declared on this basis. However any student who has already obtained the passing minimum for the practical examination in the Internal assessment itself and is unable to take the university practical examination owing to illness or for any other valid reason, he may be permitted to appear for this examination at the corresponding semester next year provided he applies for it through the principal before the end of the present examination.

11. There shall be no detention from one semester to the next.

## INTERNAL ASSESSMENT

1. A good instructor has to assess that the student has achieved in the course objectives after instruction. This is not possible without continuous assessment. The semester system provides opportunities to the instructors for continuous assessment and evaluation of the student. This assessment should be based on the following:

   1. Written tests
   2. Seminars and Quizzes
   3. Assignments, Field-work etc.

   For the uniformity of assessment, 3 tests, 2 assignments and short quizzes should be conducted during each semester and the marks be assigned to them follows:

| | |
|---|---|
| Written tests | 15 marks |
| Seminars and Quizzes | 5 marks |
| Assignment, Field-work etc. | 5 marks |
| | 25 marks |

Note: (1) In the case of Mathematics, Numerical Mathematics and Statistics ancillaries, the internal assessment marks is 20 and it is divided as written test 12, Assignment etc. 4 and quizzes 4.

(2) In the case of B. Sc. (Spl.) subjects, separate instructions are issued.

2. In order to encourage improvement in the performance of students and to allow for absence from tests due to sickness etc., it has been agreed that out of the three tests conducted the average of the two best marks shall be taken for assessment.

   Only three tests in a subject shall be conducted during a semester, spaced at intervals of about a month, and all three marks shall be sent to the university. The average of the two best of the three marks shall be taken for assessment.

If two or three teachers are handling of the subject constituting a single paper, they may each hold three one hour tests during a semester, spaced a month apart. However, the average of all the tests held at the end of each month shall be taken as one test mark. Alternatively, all the teachers may join together and give a single 3 hour test at the end of each month.)

But in the case of quizzes and assignments, the average of the 3 quizzes and 2 assignments shall be taken.

3. Supplemental tests, and quizzes may be conducted by the teacher for students who could not attend these due to valid reasons. However, if a student attends only one test, the marks in the other test should be taken as zero and average of the two tests taken as the final marks for the tests. Similar procedure will be adopted for quizzes and assignments.

## PRACTICALS:

Some of the objectives which may be developed and evaluated during the practical work are the following:

a. to handle equipment and material
b. to design
c. to conduct experiments
d. to tabulate and classify the data
e. to analyse and interpret data
f. to formulate hypothesis and
g. to draw tentative inferences.

Students should be trained in maintaining scientific observations and recording these observations systematically as required in the various disciplines in the observation note book.

Laboratory work shall be assessed continuously in every practical class.

The ratio of Internal to External assessment shall be 50:50.

There shall be a university Examination with one external and one internal examiner present. The internal examiner will be the teacher from the college who has handled the class. For the Science major subjects there shall be a practical examination at the end of each semester/year and for ancillary subjects at the end of the 2nd, 4th and 6th semesters.

There shall be no specific record book, but observation note books shall be maintained and produced during the external examination; the internal assessment will be based on the laboratory work and the observation note book.

## 15 UNIVERSITY OF MYSORE

The semester system has been introduced at the P.G. Level from the academic year 1976-77 with the unanimous support of the P.G. council. The Semester system is not a mere division of the annual course into two halves. It is an organisation pattern with many special features and advantages which must be realised in adequate measure to make it productive and successful.

Each semester is a 'self contained unit' in the total programme with its own courses of study and scheme of evaluation and extending over half an academic year.

Adoption of the semester system: All the general bachelor degree courses (B.A., B Sc., B.Com., B.Ed., L.L.B., B.E. etc.) in the Faculties of Arts, Science, Commerce, Education, Law & Engineering (except medicine) have been re-organised on the semester system, on the following lines with effect from the academic year 1976-77.

The academic year will be divided into 2 semesters each with a minimum of 16 weeks of instruction.

Pattern of Courses: The instructions load for students in each semester may be limited to an optimum of 25 to 27 credit hours a week.

Number of Courses: 5 or 6 courses (subjects) in each semester. Each course may be given 5/4 teaching hours a week. In the case of subjects with practicals, this may be two hours of class room teaching in theory and 3 hours of practicals. In each case of subjects without practicals, it may be 5/4 hours assignments, seminar methods, workshop methods, tutorials, etc. and make use of all appropriate and available teaching aids/materials. The minimum requirement for qualifying for the degree in a one year degree course (like B. Ed.) will be 10 semester courses like B.A., B. Sc., of 40 semester/credit hours. For 3 year course like B.A., B. Sc., B. Com., B. Music and L. L. B., the total requirement for the degree will be a minimum of 30 semester courses with at least 120 semester/credit hours spread equally over 6 semesters.

Number of credits required for the courses are as follows: B.A. - 154 hrs; B. Sc. - 166hrs; B. Ed. -36hrs; Law-148hrs; B. Com - 152hrs. A course which covers one hour of teaching/week carries one credit (per) semester.

Scheme of instruction and assessment: Each institution will prepare an adequately detailed scheme of instruction and evaluation in each course, following the guide lines given, and notify it at the beginning of the semester concerned for the benefit of both teachers and students.

## Evaluation

Distribution of Marks: The total marks for each semester course of 4 or 5 credit hours may be 100 marks which may be apportioned as follows: (a) subjects without practicals: only theory sessional work 25% (on the basis of 2 tests & one other assessment atleast. Semester examination 75%.

b) Subjects with practicals: (integrated with theory)

- i) Theory (sessional) - 10% (on the basis of the mid session test).
- ii) Practicals (sessional assessment only) - 40%
- iii) Semester examination (theory only) - 50%

c) In subjects with practicals, but without such integration of theory and practicals, and in independent practicals, each course in practicals will be treated as a separate course with due credit.

Sessional Assessment in Theory: The credit for sessional work in theory may be decided on the basis of two short tests and at least one assignment as appropriate, and on the basis of the mid semester test in case where it is only 10 marks in all. Each test may be of one hour duration and may employ to the extend desirable/possible short answer and objective type questions with a high degree of specificity rather than essay type questions.

Sessional Assessment in Practicals: In all cases of practicals, credit as assigned above will be awarded on the basis of continuous evaluations of all sessions of practicals, and there will not be any formal practical examination at the end of the course.

Performance in each practical session in subjects like Physics, Chemistry, Botany, Zoology and Geology, may be assessed and given credit out of 10 marks with due consideration to different aspects like:

i) knowledge of relevent processes ii) operation by skills involved, iii) results/products including calculations, and iv) reporting. Atleast ten sessions of practicals must be assessed in each course unless the number of experiments. prescribed is less than 10.

In the case of subjects like teaching, music and speech where the same overall competence that is assessed is expected to improve under guidance and show a more or less steady rise, the first few sessions need not be assessed. However, at least 10 such assessments must be made in a course/practical.

Requirement for pass: At least 40% marks in each course or part thereof as clearly stipulated in that semester.

Classification (i) Those who clear each semester of a total course at the first attempt and get aggregate marks of 60% or more will be declared as having passed in the I class.

(ii) Those who get 50% or more of the aggregate irrespective of the number of chances taken to clear the different semester courses will be declared to have passed in the second class.

(iii) All the others who complete the course by passing each semester examination by the minimum standards as defined above will be declared to have passed in the III class.

## 16 UNIVERSITY OF NORTH BENGAL

Semester system is not followed in this university in any of the courses; but internal assessment valuation is followed.

Ordinances relating to internal assessment in the B.A. /B. Sc. /B. Com (Pass and Honours) Examinations for Collegiate candidates.

These ordinances shall come into effect from the Academic session 1976-77, that is, B.A/B. Sc. /B. Com/Part I Examination, 1976 and Part II Examinations, 1979.

### Percentage of marks in University Examinations

The University Examinations in B.A/B. Sc. /B.Com. (Parts I and II will be for 80 percent of the marks in each of the subjects)

### Percentage of marks for internal assessment

20 percent of the marks in each of the subjects will be allowed to internal tests to be conducted by the colleges.

### College Tests

The colleges will take written tests of two hours' duration of the students twice in every academic session with prior intimation to the controller of Examinations of such dates and the Principals shall, within one month from the date of completion of each test, send to the controller of examinations the tabulated marks in triplicate obtained by the students in proforma to be supplied by the Controller of Examinations.

The questions set at different internal tests held by the Colleges should be sent to the Controller of Examinations immediately on completion of each test.

Answer scripts relating to such test examinations should be preserved for at least 3 years.

The University may, if it so desires, inspect and supervise the internal tests and may also, as and when necessary, revise the internal marks obtained by the students of a particular college, and take suitable measures for proper maintenance of academic standard.

## Eligibility for appearing at University Examinations

A candidate shall be eligible for appearing at the university examinations only if he obtains pass marks in the internal tests, namely, 34 percent marks. However, for Part I Examination the eligibility to appear at the University examinations will be determined by the best marks obtained by a student in the aggregate in three out of four internal tests to be held by a college.

## Declaration of Results

A student in order to be declared passed will have to obtain pass marks in the internal tests as well as in the university examinations separately, and these marks will be shown separately, for every student along with the name of the college to which the student belongs.

## Duration

A candidate who, after passing the internal tests fails to pass the University Examination, may appear in the same examination in two consecutive years without attending classes (in case of Science Student he must do the Practical Classes). The marks secured by him in internal tests would be kept alive for two consecutive years.

## Repeal

All Ordinances, Regulations, and Rules relating to admission of student to B.A./B. Sc./B. Com. Parts I and II Examinations for collegiate candidates which are repugnant to the conditions of these Ordinances shall cease to have effect from the academic session 1976-77. Provided that those students who were admitted in a college before 1976 may appear in examinations as per existing Ordinances, if they are otherwise eligible.

Provided further that the external candidates would be guided by the existing Ordinances, or by such Ordinances, as would be made hereafter for them, in the matter of total marks for the public examinations.

## 17. NORTH - EASTERN HILL UNIVERSITY

Semester system has been introduced in all Post Graduate courses of the university from the year 1976. There will be 2 semesters in each year with a minimum of 90 teaching days in each semester; there is no semester system followed for any of the Degree courses.

## 18 UNIVERSITY OF POONA

The Semester System of examination shall be introduced from the academic year 1977-78 as under:

For the first year commencing from July 1977.

For the second year commencing from July 1978

For the third year commencing from July 1979

A fresh student shall be admitted to the first/third/fifth semester only at the beginning of the academic year.

A student for the three-year integrated B.A. degree course shall study six courses in each semester of the first, second and the third year.

There shall be three periods of lecturing and one period of tutorial in a week per semester course. Each period for lecturing as well as for tutorial be of 45 minutes' duration. The tutorial batch shall consist of not more than 30 students.

## Assessment:

The assessment of the students shall be both internal and external. The over-all assessment of the students will include both.

There shall be a continuous internal assessment by the teacher teaching the subject and at the end of the semester, there shall be university examination i.e. the external assessment.

For each semester course, the ratio of the marks of the internal assessment in relation to those of external assessment shall be 40:60.

The question papers for the external assessment will be of two hours' duration.

The internal credit of 40 marks under each semester course shall consist of as under:

| | | |
|---|---|---|
| 1. | Written test | 25 marks |
| 2. | Oral, participation in seminars, tutorials, etc. | 10 marks |
| 3. | General impression (which includes regular attendance, punctuality and sincerity in day to day work. | 5 marks |
| | | 40 marks |

The external assessment shall be based on the external written examination to be held at the end of each semester for each course by the university.

Standard of Passing: To pass the examination a candidate is required to obtain 40% of marks at the external and internal examinations put together subject to the condition that candidate obtains at least 21 marks out of 60 marks in each course separately. In the case of external students, candidates are required to obtain 40% of marks i.e. 24 marks out of 60 marks.

There shall not be variation of marks more than 15% between the internal assessment and the external assessment. If the marks of internal assessment exceed the marks of external assessment of the same semester course (percentwise) by more than 15% the marks earned in internal assessment shall be brought down to that extents. The marks awarded by a teacher in the internal assessment will be immediately notified to the student concerned.

Backlog (both for internal and external candidates): There shall be no restriction of backlog for proceeding from odd to even semesters viz, I to II, III to IV and V to VI.

The result of the I, III and V, semester examinations will not be declared publicly. However, the marks will be communicated to the colleges and to the external students.

For admission to the 3rd semester course, a candidate shall have passed in at least 10 courses, irrespective of whether these courses are cleared in the examination at the end of the 1st semester and/or at the end of the 2nd semester and shall be allowed to carry a backlog of not more than two courses in the 3rd and/or 4th semesters.

Similarly, for admission to the 5th semester course, a candidate shall have passed in atleast 10 more courses, irrespective of whether these courses are cleared in the examination at the end of the 3rd semester and/or the end of the 4th semester and shall be allowed to carry a backlog of hot more than four courses in the 5th and/or 6th semesters.

Grading: The result of the final degree examination will be declared in terms of grades. The authorities of the university have accepted the suggestion of the U. G. C. of seven point grading system. The switch over to a grade instead of marks will be gradual. In the beginning, the evaluation of internal as well as external will be made in numerical marks. At the final degree examination, numerical marks obtained by the candidates will be converted into grades.

Question Bank: For each semester course, there shall be, to the extent possible, a collection of a question bank of actual or typical questions spread over the entire syllabus of the semester course. Each question paper of each semester course shall contain the questions worth 50% marks from the question bank.

External Candidates: (a) A candidate may take his degree as an internal candidate or as an external candidate but not partly as an internal candidate and partly as an external candidate.

(b) For external candidates, there would not be an internal assessment, but they would appear for the same external assessment of 60 marks for each semester course alongwith the internal candidates. Their final assessment will be based only on the external assessment of 60 x 36 = 2160 marks.

(c) An internal candidate, after having appeared for external assessment of all the requisite courses, may opt to be declared as external candidate if the helps him to improve his grade. In such case, he will be given only the transcript for external candidate.

Transcript for Internal Candidates: Every internal candidates shall be given transcript at the final degree examination which will indicate both numerical marks as well as grades. His examination for all the courses will be of 100 x 36 = 3600 marks.

Transcript for External Candidates: There shall be separate transcript for the external candidate which will give his numerical marks as well as graduation in proportion to the percentage of marks obtained in all the courses out of 2160 (60 x 36) marks.

## 19. ROORKEE UNIVERSITY

This university has started the semester system since 1963-64 for post graduate M.E. courses, since 1964-65 for unde graduate B.E. courses and for M.Sc. from the year 1969-70.

There are two semesters in a session of five months' duration each year. The first semester is called Autumn semester which begins after the summer vacation i.e. in the middle of July and ends in the 3rd week of December. The II semester is called the spring semester beginning after the winter break i.e. in the first week of January and ending in the 3rd week of May. The Autumn semester Examination and Spring semester Examination are usually held 8 days before the end of the each semester.

The academic requirement for the course is different, viz. - 48 to 50 units for B.E. and B. Arch. courses and 18 to 21 units for M.E./M. Tech. courses. Internal assessment is also being done.

## 20. SARDAR PATEL UNIVERSITY

Semester system has been introduced since the academic year 1969-70. Different faculties have been given this system in different academic years.

| Undergraduate Level | Year of introduction |
|---|---|
| Faculty of Science B. Sc. Degree | 1972-73 |
| Faculty of Engineering and Technology B. E. Degree | 1969-70 |
| Post Graduate Level | |
| Faculty of Science M. Sc. | 1969-70 |
| Faculty of Engineering & Technology M. E. & M. Tech. | 1969-70 |
| Faculty of Law | 1971-72 |
| Faculty of Education M. Ed. | 1975-76 |
| Faculty of Arts & Commerce | 1975-76 |

U.G. Level

Faculty of Science (B. Sc.): The three year B. Sc. Degree course is divided into six semesters and the syllabus of each subject is split up into different course units. Each semester consists of 27 credits and university examinations are held at the end of each semester. Sessional assessment consists of three periodical tests for a course carrying 3 credits and two periodical tests for a course carrying 3 credits and two periodical tests for a course carrying 2 credits and four quizzes per course for theory course and two periodical tests and two quizzes for practicals.

Faculty of Engineering & Technology: B. E. & B. Tech.

The Examinations of each semester is held twice a year.

Faculty of Home Science: The sessional assessment at this level consists of two tests per term, quizzes, term papers and assignments.

Faculty of Education (B. Ed.): The ratio between sessional and external assessment is 40 : 60.

### P.G. Level

Faculty of Science (M. Sc.): M. Sc. degree course has been divided into four semesters. Each semester consists of 18 credits. Viva-voce is held at end of the IV semester which consists of 4 credits. For sessional assessment, 30% marks are reserved for tests, 20% for seminar, quizzes and 50% for practicals.

Faculty of Engineering & Technology (M.E., M. Tech.):

The course is divided into four semesters. Sessional assessment consists of 2 tests per term, quizzes, term papers and assignments.

Faculty of Law: Examination for each semester is held twice a year. Sessional assessment consists of one test per term, quizzes, term, papers and assignments.

Faculty of Home Science: Sessional assessment at the P.G. Level constitutes 30% marks for two tests per semester, 20% for seminar, home work, quizzes and 50% for laboratory work.

Faculty of Education (M. Ed.): At this level both full time and part time courses are conducted. Full time course is of one year and part time course is of two years. Internal assessment consists of 20% marks for tests 10% for quizzes, 10% for home work and 10% for term paper.

Faculty of Arts & Commerce (M.A. & M. Com.): M.A. & M. Com. courses are divided into four semesters and university examination is held at the end of each semester. Each semester consists of 16 credits.

## 21 SAURASHTRA UNIVERSITY

There is no semester system at first degree level in the faculty of Arts, Science, Commerce and Rural Studies. However in Engineering, Medicine, Education and Law faculties, the courses are conducted on semester system. Post graduate studies in science are being conducted on semester system.

Provision for internal assessment has been introduced in the following examinations:

1) B.A., 2) B. Sc., 3) B. Com. 4) Rural Studies
5) Premedical, I, II, & III M. B. B. S.

There is tutorial work/term work system in the following courses:

1) Faculties of Arts, Science, Commerce and Rural Studies at degree level.
2) Premedical, I, II, III M. B. B. S.
3) Faculty of Technology including Engineering.

Courses of Study:

COURSES OF STUDY: There is no semester system in B.A., B. Sc. or B. Com. Level.

For M.A. and M. Sc., & M. Com Courses Duration two years comprising 4 semester terms.

For B. Ed. : Duration - I year i. e. 2 terms.

M. Ed: There is no semester system. Duration 1 year for full time students and 2 years for part time students.

Faculty of Technology including Engineering (B. E.)

Duration: $5\frac{1}{2}$ years. i. e. 11semester

Branches: Civil, Electrical, Mecnanical and Production Engineering.

| | | | |
|---|---|---|---|
| I | Semester I | (C. M. E. P.) | Common to all Branches |
| II | Semester II | (C. M. E. P.) | |
| III | Semester III | (C. M. E. P.) | |
| IV | Semester IV | (C. M. E. P.) | |
| V | Semester V | Civil | |
| | Semester V | (M. E. P.) | |
| VI | Semester VI | Civil | |
| | Semester VI | (M. E. P.) | |
| VII | Semester VII | Civil | |
| | Semester VII | Civil sandwich based | |
| | Semester VII | Mech. | |
| | Semester VII | Mech. sandwich based | |
| | Semester VII | Elect. | |
| | Semester VII | Elect. sandwich based | |
| | Semester VII | Production sandwich based | |
| VIII | Semester VIII | (Civil) sandwich based | |
| | Semester VIII | (Mech.) & (Mech) sandwich based. | |
| | Semester VIII | (Elect.) & (Elect.) sandwich based | |
| | Semester VIII | (Production) sandwich based | |
| | Semester IX | (Civil) | |
| | Semester IX | (Civil) sandwich based | |
| | Semester IX | (Mech.) | |

| | | |
|---|---|---|
| IX | Semester IX | (Mech) sandwich based |
| | Semester IX | (Elect.) |
| | Semester IX | (Elect.) sandwich based |
| | Semester IX | (Production) sandwich based |
| X | Semester X | (Civil) and (Civil) sandwich based |
| | Semester X | (Mech.) sandwich based |
| | Semester X | (Elect.) sandwich based |
| | Semester X | (Production) sandwich based |
| XI | Semester XI | (Civil) sandwich based |
| | Semester XI | (Mech.). sandwich based. |
| | Semester XI | (Elect.) sandwich based |
| | Semester XI | (Production) sandwich based |

Facuty of Law:

i) L. L. B. (General) : Two years (4 terms)

I. L. L. B. Monsoon term & Winter term.

II. L. L. B. Monsoon term & Winter term.

ii) Special L. L. B. One year (2 terms)

Monsoon term and Winter term

iii) L. L. M. 2 years & No terms.

Faculty of Medicine (M. B. B. S.) Duration $4\frac{1}{2}$ years.

Before the degree is conferred and after passing Final M. B. B. S. Exam, candidates have to undergo training for a period of one year.

M. D. & M. S. Duration 3 years

STANDARD OF PASSING:

Faculties of Arts, Science & Commerce B.A., B. Sc., B. Com; To pass the examination, a candidate must obtain atleast 36% marks in each subject. I class-atleast 60% II class at least 48%.

M.A., M. Sc. & M. Com. : To pass the examination, a candidate must obtain 36% in each paper and 40% in aggregate. I class - 60% (at least) II Class - 48% (atleast) I class with Distinction - 70% (atleast).

### Faculty of Education:

B. Ed. To pass the examination, 30% minimum in each paper and an aggregate of 40%. I class with distinction : Atleast 60%; I class, : 60% (at least). II class 50% (atleast).

M. Ed. To pass the examination 36% in each subject and 40% in aggregate. I class: 60%, II class: 48% (at least)

Faculty of Law: (L. L. B. Spl. & General): To pass the examination, 33% in each paper & 50% in aggregate. I class 60% II class - 50% pass class - passing by compartment.

L. L. M. To pass, 36% in each subject and 48% in each part. I class with distinction 70% I class - 60%; II class - 48% atleast.

Faculty of Tech. including Engineering: B. E. To pass, 40% marks in practical and term work or 45% marks in theory sessional, practical & term work provided 30% marks in each head of theory sessional, practical and term work.

Classes shall be awarded at the end of X Semester. I class with distinction - 66% (atleast) I class - 60%; II class - atleast 45%.

Faculty of Medicine Premedical. I, II & III M. B. B. S. Exams. (U. G.) : To pass the examination, 40% marks in theory, Practical and oral taken together in each subject, at the university examination as well as in internal and 50% marks in theory, practical & oral taken together in each subject allotted to the internal assessment and the university examination taken together.

(P. G.)M. D. & M. S. : A candidate is declared to have passed the examination if the thesis submitted by him is accepted by the examiners.

## 22 SHIVAJI UNIVERSITY

The Shivaji University has introduced the semester system for certain faculties. The semester system was first introduced in the Faculty of Engineering in the year 1965-66. Its successful working encouraged its extension to other faculties in the Faculty of Science in the year 1968-69, at the B. Sc. level and in the Faculty of Commerce in the year 1974-75 and also in the Faculty of Medicine from 1976-77. The university has also decided to introduce semester system in the Faculties of Arts and Social Sciences from June 1978-79 for B.A. Part II and III courses (Second & Third year). In the Faculty of Medicine, semester system has been introduced and the same has been introduced in the Science Faculty at P.G. level. There is no semester system at present for M. Com. and for any of the courses in the Faculties of Arts and Social Sciences.

In the Faculty of Engineering, there is examination in which besides the written paper, 25/50 marks (for some subjects 100 marks also) have been assigned for term work done in the College.

Assessment of term work is based on the depth of understanding of the principles involved and not merely the formal correctness of results. Passing in term work is a pre-requisite for appearing at the semester examination. Besides this, mid-semester test is conducted by the college. This system has compelled the students to work more assiduously.

In the Faculty of Science, there is a six-monthly examination of the university besides a mid-semester test conducted by the college and day to day practical work or credit is given for the performance in the mid-semester and for day to day practical work completion of assigned works insisted upon.

In the Faculty of commerce, alongwith the semester course prescribed, in the subject of Accountancy, Practical work is provided for the curriculum.

In the Faculty of medicine for the first M. B. B. S. course, there is no university examination at the end of the I semester but there is a university examination for semester II at the end of the II term carrying 200 marks each in theory and practicals and orals for each subject and the final examination for semester II is to be held at the end of the III term. The syllabus for Second semester examination covers portion taught during the I & II terms. At the semester III examination, 90% marks both in theory and Practical and Orals are assigned for portion taught in the II term and the remaining 10% marks are assigned for the portion taught during the I & II terms. This will have a salient effect in making the subjects remain in touch with the courses studied by them in the past in order to build up their knowledge in the subjects concerned. Credit is given for the performance in the mid-semester and regularity of attendance.

Exams. Semester examinations are held at the end of each term in defined unit of courses of study out of the syllabi generally required to be completed during a period of one academic year and as such no additional financial burden is likely to crop up in the introduction of semester system.

## 23. SOUTH GUJARAT UNIVERSITY

Semester system is followed in this university only in the Faculties of Engineering and Law, M.R.S. course and M.B.A. course.

### Faculty of Engineering: B.E. (I to V) Branches; Civil, Mechanical & Electrical

The duration of the course is five years. Each year shall be divided into two sessions (session I and II) for every year and a candidate shall be allowed to join the II session of a particular year irrespective of his result of I session examination of the particular year, except in the case of failure in a term work held.

### Examinations:

Examination for all subjects (including theory, termwork and practical or oral) of both the sessions shall be conducted at the end of every session before or after the close of the term.

The new scheme as given in fore going of ordinances and the following regulations shall come into operation with effect from June 1970 for B. E. I. to IV (C. M. E.) Examinations and from 1971 for B. E. V (C. E. M.) Examinations of the 5 year integrated course.

Regulations: (Effective from October '73 Examinations)

For being declared to have passed any examination in Engineering , a candidate must obtain atleast 36% of the full marks in theory head of each subject, 48% of the full marks in termwork practical (including oral and/or sketching) head in each subject.

In case, a candidate fails at an examination the marks assigned to all theory papers, term work, practical or oral in which he passed, shall be carried over so that he will be required to appear only in the heads of his failure.

Provided however, a candidate failing in any of the I or II session examinations of the final B. E. course theory at his option, reappears in all theory papers, practicals and oral examinations of that session in which he has failed for being eligible for the award of a class. In such cases only the term work marks will be carried over.

A candidate failing in Termwork at any examination shall have to fill in fresh term (semester) as a regular student.

Award of Class: (effective from October 1973)

The award of class from B. E. I to B. E. IV class shall be based on the aggregate performance of a candidate in Examination of both semesters of particular year.

No candidate shall, however, be eligible for class at any one of the Examination of B. E. I. to B. E. IV class unless all the subjects of each of the session are passed at the same sitting (i. e. first at the end of I session the II at the end of II session) or both of them at the end of II or subsequent sessions.

Those of the candidates who obtain 48% or more but less than 60% of the total marks and who are otherwise not in eligible as stated in Rule Engineering 2 shall be placed II class. Those above 60% but below 66% of the total marks are I class. Those with 66% or more of the total marks are of I class with Distinction. For the purpose of determing the class to be awarded at the end of Five year integrated Degree course in Engineering, the percentage of marks obtained by the candidate in session I as well as session II Examination of B. E. I to B. E. V shall be given weightage so as to constitute it as an integral part of the total, it being understood that aggregate integral total for the class at the final year shall be counted as for the following proforma.

| S. No. | Marks to be considered for integral total for award of class at final year Degree Examination. | considered as secured out of |
|---|---|---|
| 1. | 8 times the percentage of total marks secured in session I and session II at B. E. V Examination taken together. | 800 marks |
| 2. | 3 times the percentage of total marks secured at B. E. IV session-I and session II Examination taken together | 300 marks |
| 3. | 2 times the percentage of total marks secured at B. E. II session - I and II Examination taken together | 200 marks |
| 4. | 2 times the percentage of total marks at B. E. II session I & II Examination taken together. | 200 marks |
| 5. | The percentage of total marks secured at B. E. I session I & II Examination taken together. | 100 marks |

For operative of this, the marks of all the subjects obtained at I attempt of each session examination or at any other subsequent attempts at either of the session examination where the candidate has appeared in all the heads, which ever is more shall be considered.

Faculty of Law: (L. L. B.)

The duration of the course is two years consisting of Four semester.

| | | |
|---|---|---|
| 1. | I L. L. B. | Monsoon semester Exam.<br>&<br>Winter Semester Exam. |
| 2. | II L. L. B. | Monsoon Semester Examination &<br>Winter Semester Exam.<br>OR<br>Winter Semester Exam.<br>& Monsoon Semester Exam. |

Law Examinations shall be held in accordance with the curricula existing before to months of the examination i. e. in accordance with the curricula existing on Ist April for Monsoon Semester Examination and on Ist October for Winter Semester Examination.

To pass the Semester Examination, a candidate shall have to obtain (a) 33% of total marks in each paper and (b) 50% of the total marks in the aggregate.

A candidate who obtains at least 60% of the total marks obtainable in Monsoon & Winter semesters examinations or Vice versa of the I L. L. B. class and a candidate who obtains less than 66% but 50% or more of the total works in the aggregate in both the semesters examinations shall be placed in the second class.

Faculty of Business Administration (M. B. A.)

The duration of the course of study for Master in Business Administration shall be two academic years divided into four semester of durations as given below.

| | |
|---|---|
| First Semester | July Ist to October 31st |
| Second Semester | December 5th to March 31st |
| Third Semester | July Ist to October 31st |
| Fourth Semester | December 5th to March 31st. |

Candidates for the semester examinations I to IV in M. B. A. will be examined as below:

| Semester | No. of Papers | Total Max. Marks | | Total |
|---|---|---|---|---|
| | | Written Exams. | Internal assessment | |
| I | VI | 600 | 300 | 900 |
| II | VI | 600 | 300 | 900 |
| III | VI | 600 | 250<br>(viva voce)<br>50 | 900 |
| IV | VI | 600 | 200<br>(viva voce)<br>100 | 900 |

Internal assessment in a paper will be based on such periodical tests, written assignments, case discussions, syndicate sessions, field trips, etc. as may be decided by the concerned teacher with the approval of the Head of the Department.

In order to pass the M. B.A. semester examinations I to IV, a candidate will have to secure atleast 40% marks in each of the papers (Written and internal assessment taken together) prescribed for semester I to IV Examinations and also he will have to secure atleast 50% Marks in the aggregate of the two semester Examinations.

Candidates securing 50% or more but less than 60% marks in the aggregate of the 4 semester examinations will be awarded II class, those secured between 60% and 69% I class and those securing 70% and more marks in the aggregate without repeating examination. in any papers or project will be declared to have passed in I class with Distinction.

Master of Rural Studies: Consisting of 4 semesters.

This is a two year programme. It aims at preparing workers to meet the requirements of rural planning, development, and reconstruction at various level. The course design also provides opportunities to the students to acquire skills for selfemployment in rural areas in case they are for such roles.

| Semester | No. of Paper | Terms and Exam. | Concurrent activities |
|---|---|---|---|
| I | 5 | (500+50*) | 250<br>(50 for each paper) |
| | * Written and oral communication on course on independent study. | | |
| II | 5 | (500+100*) | 250<br>(50 for each paper) |
| | * i. Written or oral communication or course on independent study, 50 marks. | | |
| | * ii. Manual work/social service/aesthetic activities project 50 marks. | | |
| III | Major area of specialisation | | |
| | 2 papers each carrying 100 marks | | 200 - 100 |
| | Practical activities in specialisation area<br>Project work in the area of specialisation | | 200 - 50 |
| | Subsidiary optional group | | |

| | | |
|---|---|---|
| | 2 papers of 100 marks each | 200 - 100 |
| | | 600 - 250 |
| IV | Placement with agency | 250 - 0 |
| | Total | 2000 - 750 |

## Assignment of over all grade levels

The final result will be expressed interms of grade levels also.

| Grade Level code | Quality Level | Percentage Range |
|---|---|---|
| O | Outstanding | Above 75 |
| A | Very good | 65.1 to 75. |
| B | Good | 55.1 to 65. |
| C | Average | 45.1 to 55. |
| D | Fair | 35.1 to 45. |
| E | Poor | 25.1 to 35 |
| F | Very poor | 25 and below |
| N.A. | Not attempted or Absent | |

## 24. S. N. D. T. WOMEN'S UNIVERSITY

## FACULTIES OF HOME SCIENCE, LIB. SCIENCE & NURSING

The structure of the Three Year Degree Course in Home Science is broadly divided into four main components as under:

1. The Core Component
2. The Discipline Component
3. The Applied Component
4. The Cultural Component

Each component will consist of different credits.

Duration:

The Duration of the Course will be of six semesters, each semester generally consisting of minimum 6 weeks.

Credits:

The Home Science Course on the whole will have 100 credits each semester having an average of 16 to 17 credits.

One credit generally is equal to One hour of theory per week or two hours of practical per week.

Internal Assessment:

Fifty percent (50%) of the total is assigned for internal assessment and 50% for final examination in each course.

Evaluation:

Each test assignment, class report, practical work, examination etc. will be evaluated in terms of marks which would be converted into grades.

(Distribution of weightage for performance in daily practicals tests in theory and practicals, is given subject wise at the end of each course).

Conversion of marks into grade:

| Percentage | Grade | | Grade Point |
|---|---|---|---|
| 80 - 100 | O | (Out standing) | 6 |
| 70 - 79 | A | (Very Good) | 5 |
| 60 - 69 | B | (Good) | 4 |
| 50 - 59 | C | (Fairly Good) | 3 |
| 40 - 49 | D | (Average) | 2 |
| 30 - 39 | E | (Below Average) | 1 |
| 0 - 29 | F | (Poor) | 0 |

## Examination Pattern of the B. Lib. Sc. Course Programme

### First Semester

The theory & practical examination comprise totally 90 marks for internal assessment and 310 marks for external assessment.

### Second Semester

The theory & practical examination comprise totally 130 marks for internal assessment and 420 marks for external assessment.

### Standard for Passing

To pass the Examination in B. Lib. Sc., a candidate is required to obtain:

a) at least 40% marks or 'D' Grade in theory paper inclusive of marks/Grade obtained in Internal Assessment, at each semester.

b) at least 40% marks or 'D' Grade in the aggregate of marks Grades obtained in internal assessment, in each semester.

c) at least 40% marks or 'D' Grade in the combined theory and project work of Paper 9.

d) the marks or Grades obtained by a candidate for the Internal assessment, in-service journals and project (to Paper 9) will be carried forward as the case may be until the candidate has cleared the theory and practicals and paper 9 as the case may be.

e) a candidate who gets at least 40% marks or more or Grade 'D' and above, shall be treated as having cleared the subject (theory and practicals). She will not be allowed to appear again in the same subject.

f) in case she gets less than 40% marks or 'D' Grade in any subject or aggregate of practicals at either semester, she will have to appear in the same subject (theory or practicals).

Subject to the fulfilment of conditions as mentioned in clause No. 1 above, a candidate shall be awarded class or grade on the total marks/Grade of all the theory papers, practicals and paper 9.

## Rules for Passing Examination:

### Standard of Passing:

i) In each subject minimum of E grade in Internal Assessment to be eligible for the final examination at the end of each semester.

ii) An average of D grade (Average of Internal plus Final Semester Examination) to clear a subject.

iii) If any subject is pre-requisite to another subject then unless the pre-requisite is cleared, that subject cannot be offered.

iv) For fifth and Sixth Semester the field of specialization will have to be changed in the event of three consecutive failures (i. e. E or F) in the subjects offered under Specialization.

v) Two more chances will be given within three years in case of failure at the final degree examination.

vi) Successful completion of minimum 100 credits with an average of 2. 00 grade point in each subject is essential to be eligible for a B. Sc. Home Science degree.

### Second Class:

Subject to fulfilment of conditions as mentioned in Clause No. 1 above, a candidate shall be awarded Second Class if she obtains 50% marks or more but less than 60% marks in the aggregate of both the Semesters-theory and practical-taken together.

### First Class:

Subject to fulfilment of conditions as mentioned in clause No. 1 above, a candidate shall be awarded First Class if she obtains 60% marks or more but less than 65% marks in the aggregate of both the Semesters-theory and practicals-taken together.

First Class with Distinction :

Subject to fulfilment of conditions as mentioned in Clause No. 1 above, a candidate shall be awarded First Class with Distinction, if she obtains 65% marks or more separately in theory and practicals.

Bachelor of Nursing :

Scheme of Examination:

University examinations shall be conducted in April and November every year in the subjects covered during the respective semesters.

There shall be internal assessment in all the subjects.

A candidate shall be eligible to sit for the University examination only if she has obtained 30% of marks in the internal assessment of each subject.

Standard of Passing

1. A candidate shall be declared to have passed the examination if she obtains not less than 50% of marks in each of the nursing papers and in the practicals and orals.

2. Candidates who pass in all the parts of the examination at one and the same sitting and obtain not less than 60% of the total marks shall be placed in the first class.

3. Candidates who obtain 75% of the total marks shall be classed as having passed with distinction.

4. Candidates shall be required to pass in all the papers and practicals of the 1st semester before being admitted to the 2nd semester. The final grade of the candidates will be decided by the average of the marks obtained in all the six semester examinations.

5. If a candidate fails in any one of the papers other than nur-

sing and practicals, in any semester examination she shall be allowed to keep join term with the next semester and clear the subject wherein she has failed at the next examination.

6. If a candidate.. fails in more than one of the papers other than nursing and practicals in anyof the semesters, she shall not be allowed to join for the following semester.

7. If a candidate fails in any of the nursing papers or practicals she shall not be allowed to keep terms for the following semester.

8. If a candidate fails in theory or practicals in the nursing subjects in any of the semesters she shall be required to put in 75% attendance again in the clinical area.

9. If a candidate fails in a nursing paper and passes in practicals or vice versa, she shall be required to reappear only in the failed paper practical and not both.

10. A candidate is allowed only 3 chances to appear in any of the failed subjects.

Students who have done sociology or psychology in the Higher Secondary will be exempted in these subjects.

## 25. SRI VENKATESWARA UNIVERSITY

### A Report on Semester System in Sri Sathya Sai Arts And Science College for Women: Anantapur

This is one of the three Colleges selected in Sri Venkateswara University area to adopt Semester system with continuous evaluation, on experimental basis. The first Degree B.A., B. Sc., and B. Com., students of this academic year i. e. 1977-78 are studying through this system.

In this College the First B.A. class consists of about 65 students, B. Com. class - 23 and the B. Sc. class around about 55 students.

Under this system, internal assessment is for a maximum of 25. While the external assessment is for a maximum of 75. Total 100 marks. Out of 25 marks allotted for internal assessment, 15 marks are allotted for tests (the best tests to be considered out of three tests) 5 marks for quizzes and 5 marks for assignments and tutorials. Total 25 marks. A student is supposed to get 10 marks minimum in the internal assessment. The test, and assignment papers are to be preserved for scrutiny if required.

To avoid the unnecessary clash in the programme of various subjects, a particular day is fixed in the week for each subject. It is left to the discretion of the teacher in-charge to hold either test/assignment etc. But the entire plan is put up in the notice board for the convenience of the students, with a copy to the Principal. Topics for tests/assignments etc. will be announced to the students well in advance. Marks obtained by the students is maintained in a register.

## 26 VIKRAM UNIVERSITY

Semester system is followed only at the P.G. Level. Year of introduction - 1976-77 onwards. The course will be divided into 4 teaching units (semesters). The achievements of students will be assessed therein through at least 5 periodical tests spread over the session in each theory paper, and in practicals. At the end of the session, there shall be annual university examination on the whole course. The answers to question in both the internal assessment and the annual university examination will be valued by the teachers and examiners concerned by giving letter grades with corresponding grade points for each question on a seven point scale as follows:

| Assessment | Letter grade | Grade point |
|---|---|---|
| Outstanding | O | 6 |
| Very good | A | 5 |
| Good | B | 4 |
| Average (Fair) | C | 3 |

| | | |
|---|---|---|
| Ordinary | D | 2 |
| Poor | E | 1 |
| Very Poor | F | 0 |

After marking the grade and the corresponding grade point for each question the grade points will be totalled up, and the average calculated upto 2 decimal places. This will represent the grade point average of the script. Rounding off the decimal places will be done according to the rules of computation at the final stage of the result only, for calculating the grade point average of the total assessment (internal or annual).

The grade point average so obtained for all papers may then be computed to a cumulative grade point average, which can then be rounded off and converted back to grade average in theory or practical.

The weightage for theory and practical in science subjects shall be in the ratio of 2:1. The weightage of the sessional (internal) award to the award for excercise set at the annual University practical examination shall be in the ratio of 1:4 in case it is proposed to calculate the combined grade point average for internal annual tests.

a) In order to qualify for the annual university examinations, a student shall secure at least grade D in the internal assessment (for theory and practical separately).

b) A minimum grade D (separately in theoryand practicals if any) shall be necessary to succeed at the annual university examination.

The over all cumulative grade point average & grade average may be determined on the basis of 75% and 25% & 90% and 10% weightage to the annual university examination and the internal assessment respectively for both theory and practicals. But, it will be open to a university not to workout and show such C. G. P. A. by combining the awards for the internal assessment and its annual examination.

The final result of the P. G. Courses will be computed by combining the (overall) cumulative grade point averages of the previous and final year both in theory and practicals.

Regulations:

Each test for internal assessment will ordinarly be of 45 minutes duration. The number of questions will be determined by the teachers concerned. The teachers could give short subjective type questions, multiple choice tests, open book tests/ problem oriented exercises, quizzes,field work or projects etc.

Examinations:

There will be a semester break of 15 days after each semester examination.

The semester examination shall be partly by means of papers and partly by practicals. In Maths., the examinations shall be partly by papers and partly by viva-voce.

The achievements of the students will be assessed through 3 periodical tests spread over each semester in both theory and practical. In the semester system of examination, overall group of internal and external assessment will be combined to determine the general grade. In the place of marksheet, the students will be given grade card with all the necessary details given.

## 17. ANDHRA PRADESH AGRICULTURAL UNIVERSITY

The Andhra Pradesh Agricultural University Act, 1963 has made some regulations which may be called "The A. P. Agricultural University Regulations" governing the undergraduate courses of study leading to the award of B. Sc. (Agriculture), B. V. Sc. and B. Sc. (Home Science) degrees in the Faculties of Agriculture, Veterinary Science and Home Science respectively.

Courses, Credits and Syllabi:

The details of the courses, credits and syllabi of the under graduate courses shall be as prescribed by the Academic council from time to time. Each course shall be offered every semester.

i) 8 semesters for Faculty of Agriculture
ii) 10 semester for Faculty of Veterinary Science.
iii) 6 semesters for Faculty of Home Science

The academic status of Student shall be determined solely on the basis of their completion of number of credit hours which is prescribed for each year of standing under each faculty.

## FACULTY OF HOME SCIENCE

| | | |
|---|---|---|
| I year standing | 1 - 36 | credit hours. |
| II year standing | 37 - 72 | credit hours |
| III (Final year standing | 73 - 108 | credit hours. |

## FACULTY OF AGRICULTURE

| | | |
|---|---|---|
| I year standing | 1 - 36 | credit hours |
| II year standing | 37 - 72 | credit hours |
| III year standing | 73 - 108 | credit hours |
| IV (Final) year standing | 109 - 144 | credit hours |

## FACULTY OF VETERINARY SCIENCE - 1973-74 BATCH ON WARDS

| | | |
|---|---|---|
| I year standing | 1 - 37 | credit hours |
| II year standing | 38 - 73 | credit hours |
| III year standing | 74 - 109 | credit hours |
| IV year standing | 110 - 145 | credit hours |
| V (Final) year standing | 146 - 160 | credit hours |

## Evaluation of students, Examinations and Grades:

Evaluation of student's achievement in a course shall be based on his performance in various kinds of examinations, tests, assignments, records, classwork and other types of excercises

Periodical Examinations

Periodical Examinations of various types, quizzes etc. will be held by the teachers during the semester. Assignments involving laboratory, library and field work and seminars may also be given by the teacher. There should be two quizzes and two periodical examinations of one hour duration each in a semester. Attendance at the two quizzes and one of the periodical tests is compulsory. If a student attends the two tests, the least marks obtained by him at any one of these tests are eliminated for computation of grades. The quizzes may be conducted written or oral and may be announced or unannounced. No re-examination for periodical test and Quizzes will be held under any circumstances. However, students who are deputed by the university for any extra co-curricular activities may be given an opportunity for re examination of any tests missed during the period of deputation.

No classes shall ordinarily be held from two days prior to the commencement of semester final examination.

The semester final Examination in theory may be of 2 to 3 hour duration. It shall be the responsibility of the university Head of the Department concerned for the conduct of semester final examinations and maintanance of uniform standards in the subject, in all the constituent college/colleges.

The semester final practical examination of not less than 3 hour duration shall be conducted by the teacher concerned.

Students absent for final semester examinations shall be awarded an interm grade (X) in that semester which shall be created as equivalent to "incomplete" for purposes of calculations of G.P.A.

In case, the students absent themselves for the final semester examination without the permission of the principal, their grades in the respective courses should be calculated on the basis of performance of previous tests and Zero for the final semester examinations.

## Computation and award of course grades:

For computing final grades, the marks to be allotted between the theory and practical work shall be approx. in proportion to the number of credit hours allotted to each. For example, in a course with 2 credits theory and one credit laboratory work 70% will be allotted to the theory and 30% to the practical examinations

The weightage between the various examinations and assignments conducted during a semester shall be as follows:

| | | |
|---|---|---|
| Theory | One periodical test | 30% |
| | Two quizzes | 20% |
| | Semester final exam. | 50% |
| Practicals | Records & Class work | 50% of the marks allotted to practicals. |
| | Final examinations | 50% of the marks allotted to practicals. |

## Grades and Grade Points

The final grading of students in this system shall be done in letter grades. There are 5 grades in all viz. A, B, C, D and F. Each grade carries certain point(s). The significance of each grade and the points which it carries are given below:

| % marks to be obtained | Grade | Significance | Points for each credit hours. |
|---|---|---|---|
| 90 - 100 | A | Excellent | 4 |
| 80 - 89 | B | Good | 3 |
| 70 - 79 | C | Fair | 2 |
| 60 - 69 | D | Pass but not satisfactory | 1 |
| Less than 60 | F | Failed | 0 |

The minimum overall G. P.A. required to be achieved by student to be promoted without probation to the next higher semester standing shall be 2.00. A student shall be placed on scholastic probation while being promoted to the next higher semester standing or detained as the case may be if he fails below the minimum requirements of the overall G. P.A. for his classification as indicated below:

| Cumulative G. P.A. at the end of probation | | Detention |
|---|---|---|
| | Below | Below |
| I year standing | 2.00 | 1.60 |
| II year standing | 2.00 | 1.80 |
| III year standing<br>(Not applicable to the students of Faculty of Home Science) | 2.00 | 1.90<br>(2.00 for the students of Faculty of Home Science) |
| IV year standing<br>(Not applicable to the students of Faculty of Agriculture) | 2.00 | 1.95<br>(2.00 for the students of Faculty of Agriculture). |
| V year standing | - | 2.00 |

Classification of successful candidates

The successful candidates after completion of the graduation requirements who secure an overall grade point average of 3.00 and above without recording 'F' grade in any course shall be classified under First class and all others under second class. Also a student who has repeated any course to improve his O.G.P.A. shall be placed in second though he obtains anO.G.P.A 3.00 and above.

However, irrespective of recording 'F' grade in course(s) a successful candidate who secures an O.G.P.A. 3.50 shall be awarded I class and if he secures an O.G.P.A. 3.75 and above without recording 'F' at any stage, shall be awarded I class with distinction.

## 2. CHANDRA SHEKHAR AZAD UNIVERSITY OF AGRICULTURE AND TECHNOLOGY

The Faculty of Agriculture of the Chandra Shekhar Azad University of Agriculture and Technology has introduced the semester system of education with periodical examination and internal assessment from the session 1976-77. The assessment in the undergraduate classes has been kept hundred percent internal, while for the post-graduate classes, external assessment of the thesis and internal grading in the course would be adopted.

The entire curricula (Syllabi) for the degree awarded by the University is sub-divided into a number of courses. Each course is given a credit load depending upon time required for completing the course content including class room, laboratory, field instructions and home study.

The academic year is divided in two terms each known as semester having about 20 weeks and about 110 effective days. One credit hour in a course should involve at least $1\frac{1}{2}$ to 2 hrs. home/library study.

Types of Examinations and their weightage:

There are several tests/examinations in each course during a semester as given below:

1. Short quizzes
2. Midterm examination
3. Final examination

The quizzes are as far as possible evenly spaced. The weightage of marks of different type of examinations is normally as follows:

| | | |
|---|---|---|
| 1. | Final theory examination | 40% of Final grade |
| 2. | Final Practical examination | 20% of Final grade |
| 3. | Lab. Examinations during the semester (1 or 2) | 10% of Final grade |

| | | |
|---|---|---|
| 4. | Mid term Examination (1 or2) | 20% of Final grade |
| 5. | Five quizzes during the semester which may be announced or unannounced | 10% of Final grade |

Six quizzes may be given and five better ones of the six be included. If no quizzes are given, 2 examinations (each 15% value of the final grade) should be given during the semester.

In case of courses where there is either no laboratory or no theory, following breakup is followed:

60% of Final grade - Final examination

40% of Final grade - Mid term Examination and quizzes as detailed above.

System of Grading:

Each student is examined in every course from time to time throughout the semester. In grading the students, the Instructor shall mark individual questions in numericals. The system of letter grades has been adopted in the Faculty, replacing the traditional system at all stages on 100 point scale. Answer books of students in each particular course are assessed out of a given maximum allotted to the question paper (say 100). But the assessment arrived at is not carried over as such, but is reduced to letters indicating a range given in the following table:

| Percentage of marks | Equivalent letter grade | Meaning | Numerical value of grade in point |
|---|---|---|---|
| U.G. 80-100 | A | Excellent | 4 |
| 70-79 | B | Good | 3 |
| 60-69 | C | Fair | 2 |
| 50-59 | D | Passes | 1 |
| Below 50 | F | Fails | 0 |
| P.G. 80-100 | A | Excellent | 4 |
| 70-79 | B | Good | 3 |

| | | | |
|---|---|---|---|
| 60-69 | C | Fair | 2 |
| Below 60 | D | Fails | 0 |

Following additional abbreviations will be used wherever necessary in both undergraduate and post-graduate programme:

I - Incomplete
Wh - Withheld
Au - Audit
S - Satisfactory
U - Unsatisfactory
P - Progressing
Wd - Withdrawal

In case of these grading 'S' will be used till the acceptance of the thesis. Thereafter it will be changed to 'A'. Thesis (Research) grade will not be used for calculating the final O.G.P.A. or C.G.P.A.

### Minimum Pass Standard

The minimum O.G.P.A./C.G.P.A. for both U.G. and P.G. classes are 2.50 and 2.75 respectively. In P.G. programme a maximum of 7 credits of C grade, in two courses (4 + 3) are to be allowed to a candidate to continue the course beyond which the candidate is dropped.

### Student's right to demand re-assessment:

An important feature of this system, aimed at eliminating subjectivity and arbitrariness is the right of the student to assessment. A student is encouraged to seek justification for the award of marks if he has any doubt on their validity vis-vis awards to other students. It is one of the most important functions for an instructor to satisfy students when such objections are raised, and to revise his marking if the objections raised and to revise his marking if the objections raised are valid. The revision of grades is related to well defined objective standards, and thus provide an automatic check on any wrong assessment on the part of the instructor. The changes in grades are effected only after the Dean has screened them and the Vice Chancellor has sanctioned them.

One is apt to conclude that such a freedom to students may give rise to a spate of frivolous and unjustified objections making the task of the instructor almost impossible, involving his 'dignity' and 'prestige'. It may be stated that since all assessment is internal, and the instructor is the final arbitrator, it stands to reason that the possibility of screening should be provided in order to eliminate any misuse of this absolute power, and the instructors at the Faculty will have to well attune themselves to this system.

## Check on Grading

The real problem is to check wrong grading on the part of a teacher tending to treat internal assessment as a weapon to enforce 'discipline' or to build a 'group', over-grading the favourites or undergrading others. This is the real danger of internal assessment, since this means discrimination within a group, and may give rise to justified resentment on the part of the students. For such manipulation of grading the students' right for scrutiny is the answer.

## 3. GUJARAT AGRICULTURAL UNIVERSITY

### Faculty of Veterinary Sciences & Animal Husbandry, Dairy Science and Agriculture

### Academic Requirements

An enrolled candidate in order to earn B. V. Sc. & A. H. Degree of the University shall have completed satisfactorily 233 (254 for B. Sc. Agri. and 227 for Dairy Sciences) credits prescribed for the purpose and shall have earned an over all grade point average (OGPA) of 2.00 (2.25 for all other courses).

A course credit means one hour (B. Sc. Agriculture 3/4 hour) of theory lecture, 2 hours (1.1/2 hours) of laboratory or field practical per week through a semester. The course of study includes.

a. Humanities
b. Basic Sciences
c. Veterinary & A.H. Sciences (or Agricultural Sciences or Dairy Sciences).
d. Related subjects
e. Physical Education, Or N.S.S. or N.S.O. if made compulsory
f. Internship or field training and
g. Electives.

In all the semesters the lectures will be of one hour (for B. Sc. Agriculture 3/4 hour) and practicals/clinics of 2 hours (1.1/2 hours) or more.

## System of Teaching

The semester system of teaching and continuous evaluation of student will be followed.

The duration of B. Sc. Agriculture and dairy science degree programme will be of 8 semester, (B.V.Sc. & A.H. - 10) during which the requirements of 233 course credits will be completed by a candidate for the degree.

First eight semesters will be devoted to study of different courses having a total credit load of 209 credits.

The 9th semester will be utilized for internship or field training and study tour. This training shall be acquired on approved hospitals and/or institutions. In order that semester be granted, the student will be required to be certified regarding satisfactory completion of internship training by principal or the evaluation committee of the staff nominated by the Principal. If a candidate fails to obtain satisfactory certificate, he may be asked to repeat the internship training in part or full as directed by the Principal. 10th semester will be devoted to the study of electives to enable the students to acquire practical skill in any one area of their choice, out of four such areas listed at present.

The academic year (June to April) is divided into two semesters. The duration of a semester would be of 18-20 weeks each.

Each student will be assigned to an advisor by the Dean/Associate Dean of the College during the First semester. The advisor will help the student in planning the programme of his studies. Students are expected to keep constantly in touch with, their advisor to enable the latter to watch their progress and guide them along right lines.

Curriculum and course:

The students enrolled in the university for a degree programme shall be required to follow the curriculum as pescribed.

The Curriculum shall consist of a series of courses selected and designed to provide training to meet the requirements of a degree and shall include field training and electives.

A course shall be a series of classes and work experience in a particular subject extending over a semester.

In order to become eligible for award of degree, a student shall take the required courses and undergo internship training necessary to earn the credits required for the degree programme.

In taking a course, a student shall attend a series of lectures and shall do laboratory/field work as required. He shall also put in required hours of efforts in library and at home and shall submit the assignments and reports as prescribed by the teacher of the course.

A student shall be deemed to have cleared and completed the course if he has attended the lectures and or laboratory/field classes and has completed all other work required for the course and has obtained a pass grade.

Grade 'F' and grade 'W' each for the purposes of evaluation connotes failure and is equal to zero grade value. A student getting 'F' or 'W' grade in a course shall have to clear that course for which a maximum of only three additional trials shall be given, failing which his admission will be discontinued bythe university.

When a student clears a course/courses by more than one trials the 'F' and 'W' grade/grades obtained by him will be replaced by the grade/grades obtained by him in the respective course/courses for calculating his O. G. P.A. only for the award of the degree but all 'F' and 'W' grades will be shown in his transcript and their zero grade values will be counted for calculating his O. G. P.A., for determining merits for award of scholarship, medals etc.

System of evaluation

The different types of examinations and the weightage for each shall be as follows:

| Examination | Theory | Practical |
|---|---|---|
| Internal assessment including quizzes and tests etc. | 30% on the basis of quizzes tests etc. | 30%. The evaluation will be on the basis of day to day performance in laboratory, day to day viva and maintenance of practical record work. |
| Semester end examination | 70% | 70% weightage will be given to practical and viva. |

Examinations shall be as under:

The number and mode of quizzes and tests shall be as determined bythe Committee of Deans from time to time.

A student shall not be permitted to appear at the semester-end examination of a particular course/courses, if the concerned teacher/teachers report that his academic performance is not satisfactory and/or that he has not satisfactorily carried out the laboratory or field of inplant practicals during the semester.

The evaluation awarded by the teachers in all examinations of a course shall be recorded and converted into following grades adopting the principle of clustering. The grade in a course shall be assigned by the weighted score as below:

| Grade | Significance | Value | Remarks |
|---|---|---|---|
| A | Excellent | 4 | |
| B | Good | 3 | |
| C | Pass | 2 | |
| F | Failure/Absence | 0 | |
| W | Withdrawn | 0 | Could not appear in semester end examination due to unforeseen circumstances as certified by the Dean/Association Dean. |
| R | Repeated | | To be shown in evaluation report and transcript. |
| S | Satisfactory | - | For internship/In field training, inplant training, study tour, physical education etc. |
| US | Unsatisfactory | | |

Note: Credits and grade values for Physical education, Internship, Infield training, Inplant training, Study tour etc. shall not be counted towards calculating GPA/CGPA/OGPA.

The evaluation of student's performance in assignments, quizzes, periodicals tests etc., shall be done by the teacher/teachers separately for each course. The assessed answer books of assignments, quizzes and periodical tests except the semester-end examination shall be shown to the student for his information, guidance and improvement.

There shall be no make-up examination for the semester-end examination. The student who remains absent from any of the other examinations, without valid reasons, shall get zero marks for that examination.

The students obtaining A, B or C grade in a course shall be deemed to have passed and those obtaining 'F' and 'W' grade shall be deemed to have failed in that course.

It will be obligatory for the students to earn grade 'S' for all the courses graded as 'S' or 'US' (Satisfactory or Unsatisfactory) to be eligible for the award of the degree.

Grade point average (G. P. A.) means credit multipled by numerical value of the grade for each course completed during a semester and the sum of products divided by the total course credits.

The O. G. P. A. obtained by the student shall be calculated by dividing the total grade points obtained, by the credits of the courses taken by the student upto that time.

The award of classes will be based on the O. G. P.A. (Overall Grade point average) obtained by the candidates and will be indicated in the degree certificate as shown below:

| O. G. P. A. | Class |
|---|---|
| More than 3. 7 | First class with distinction |
| More than 3. 00 upto 3. 7 | First Class |
| More than 2. 25 upto 3. 00 | Second class |
| 2. 00 to 2. 25 | Pass class. |

## 4. JAWAHARLAL NEHRU KRISHI VISHWA VIDYALAYA

### SEMESTER SYSTEM NOW FOLLOWED FROM 1972-73.

J. N. Krishi Vishwa Vidyalaya has introduced the Semester System with 50% internal and 50% external evaluations.

This is a sort of via media between the annual system with full external examination and the trimester system with full internal assessment. This is expected to ameliorate the two major weaknesses of the Trimester System. The main features of the system are detailed below:

1. The Academic Session has been divided into two semesters, each one consisting of 105 full working days plus one additional days for registration and 10 additional days for final examination. Thus there will be 2 semesters in an academic year.

2. There shall be a short inter semester break between the 1st and IInd semester and a summer vacation of approximately 6 weeks at the end of IInd semester.

3. The different types of examinations Meant for evaluation of the performance of students is given below:

| | | | |
|---|---|---|---|
| I. Internal | a) | Mid-term theory examination | — 20% weightage |
| | b) | Final, Practical and Viva-voce examination. | — 30% weightage |
| | | OR | |
| | | Final Internal Theory Examination (for such courses which have no practical) | — 30% weightage |
| II. External | c) | Final common Internal Theory Examination. | — 50% weightage |

The mid-term examination and the Practical and Viva-voce Internal Theory Examination are based on internal evaluation to be conducted during class hours entirely by the Vishwa Vidyalaya teachers/instructors. The Final Theory Examination of 50% weightage will be conducted by examiners of the Vishwa Vidyalaya who will set the papers and evaluate them.

The marks received in various examinations are to be tabulated course-wise and converted into grades according to the following schedule to maintain a uniform a standard:

| | | |
|---|---|---|
| 70% Marks and above | A | Excellent |
| 60% to 69% Marks | B. | Good |
| 50% to 59% Marks | C | Fair |
| 40% to 49% Marks | D | Poor but passing |
| Below 40% Marks | F | Failure |

(For Post-graduate there will be no 'D' grade. They will be awarded 'F' grade for marks below 50%).

> There will be no hourly tests and make-up examination. Even in the Trimester system these tests were greatly reduced to minimise the number of examinations. Now a student who misses any of the three examinations is awarded '0' (Zero) or 'F' grade for which there is no provision of make-up examination as this facility was being misused by students by mass absenteeism from examination.

This system of Semester Examination based on 50% internal and 50% common internal evaluation has been introduced from the academic session 1972-73, for the Ist Year of under - graduate and post-graduate classes only. For other classes though the semester schedule has been introduced with three examinations as above but with 100% internal evaluation. The quizzes. hourly test, and the make-up examinations have been done away with for the other classes also.

## 5. JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

Affiliated colleges in the university are (i) College of Engineering, Ananthapur; (ii) College of Engineering, Kakinada (iii) R.E.C., Warangal; (iv) Nagarjuna Sagar Engineering College, Hyderabad (v) College of Fine Arts and Architecture.

The adoption of continuous internal assessment evaluation for all the academic programmes is with effect from the academic year 1973-74. The course of study prescribed for the degree of B. Tech. and M. Tech. shall provide for specifications in the following branches (i) Civil (i) Civil (ii) Electrical (iii) Mechanical (iv) Electronics and Communications (v) Metallurgical (vi)

Chemical, and M. Sc. (Tech.) in Physics and Mathematics.

The first year of study consists of two consecutive terms of total 34 weeks including the period for annual examination. Each academic year from the second year of study consists of two semesters each of 18 weeks duration including the period for end semester examination. (a) The performance of the students in the first year and in each semester there after shall be evaluated course wise giving a weightage of 60% for continuous internal evaluation in the form of Quizzes (announced and unannounced), assignments, tutorials and a minimum of one-hour examination or 2 one-hour examinations respectively and 40% of weightage for the annual or end semester examination as the case may be In the case of practical, Design, Drawing, Workshop and Projects, Weightage shall be 75% for the work done in the classes and 25% for the end semester / annual examination.

(b) For M. Tech. and M. Sc. (Tech.) only : Thesis/dissertation:

Every candidate shall be required to present, at the end of the fourth semester, a thesis or dissertation as directed on a topic to be chosen in consultation with the supervisor in the relevant field. Work on the Thesis or Dissertation shall be initiated in the third semester and continued on a full time basis in the fourth semester. At the end, it will be valued by two examiners the supervisor and an external examiner appointed by the College Academic Committee who shall conduct a viva-voce examination also. No marks shall be awarded for the dissertation/Thesis but the examiners shall report on candidate's work as: a) Satisfactory; b) Not satisfacotry.

Candidates who fail to take any examination in any course due to sickness may be permitted to take a make-up examination on the production of medical certificate from the Medical officer of the college/Registered Medical Practitioner.

At the end of the year, in the case of first year of the B. Tech. course, or at the end of a semester in the case of other years of all semesters, a candidate shall be awarded a letter grade in each of the course he has taken during the year or semester. The grade awarded to a candidate shall be based on the evaluation of his performance in the internal and external semester examinations.

The candidates shall be classified into 9 groups based on the marks as shown below:

| Marks | Letter grade | Grade point |
|---|---|---|
| 91 - 100 | A+ | 10 |
| 81 - 90 | A | 9 |
| 71 - 80 | A- | 8 |
| 61 - 70 | B+ | 7 |
| 51 - 60 | B | 6 |
| 41 - 50 | B- | 5 |
| 31 - 40 | C | 4 |
| 21 - 30 | D | 3 |
| Below 20 | E | 2 |

The semester performance Index (S. P. I.) shall be the weighted average of the points in the semester. The cumulative performance Index (C. P. I.) shall be the index of the overall performance of a candidate up to and including the latest semester and it should be computed from the grade points of all the grades which the candidate has been awarded since his entry into the college.

A candidate shall be declared to be below the minimum academic standard if he secures:

FOR B. TECH.

| | | |
|---|---|---|
| I year | C. P. I.______________ | Less than 4.5 |
| II year | I semester: C. P. I. | Less than 4. 8 |
| III year | II semester: C. P. I. | Less than 5. 0 |

Semesters of other classes: C. P. I. less than 5. 0 and

C. P. I. less than 5. 0.

For M. Tech. & M. Sc. (Tech.)

For all the semesters S. P. I. less than 5. 0 and
C. P. I. less than 5. 0

A candidate shall be eligible to be awarded the degree of B. Tech/B. Arch, M. Tech/M. Sc. (Tech.), if he has secured a C. P. I. of 5. 0 or more at the end of the fifth year programme.

After a candidate has satisfied the requirements for graduation, he shall be placed in one of the following three classes.

With C. P. I. 7. 5 or more - I class with Distinction (M. Tech. & M. Sc. Tech)

With C. P. I. 8. 5 or more - I class with Distinction (for B. Tech/B. Arch.)

With C. P. I. 6. 5 or more - I class

With C. P. I. 5. 0 or more - II class

## 6. KONKAN KRISHI VIDYAPEETH

Semester system has been introduced by this university from the academic year 1975-76. In this system, the academic year is apportioned into two terms each known as a semester. A semester comprises of 20 weeks' duration. The system makes it possible to divide the subject matter into self contained units called 'courses' capable of being taught in a semester by lectures practicals, library reading and field work. The choice of the courses and the credit load are decided in consultation with the assigned counsellor. A student is examined in a course at intervals during the semester. After successful completion of the courses he can register for new courses in the next semester. If the performance of a student in a particular course is not up to the mark, he has the facility of making it up by repeating the course.

## 7. MARATHWADA AGRICULTURAL UNIVERSITY

Semester system is followed in this university. Semester means an academic term of 20 weeks duration, subject to minor changes in the duration, on approval of Academic Council.

### Evaluation:

Students admitted to the course will be taught and evaluated through the internal evaluation system. The details of the course, credits and syllabus of the degree course shall be such, as are prescribed by the academic council from time to time.

### Credit Load:

The student may register for a Maximum of 21 and 18 credit for undergraduate and post graduate respectively and minimum of 12 credits in a semester. He may also be allowed to register for less than 12 credits in last semester only if those credits are required for the completion of degree programme.

### Evaluation of Student's Examinations and Grades:

The evaluation of student's achievements in a course shall be based on performance in various kinds of tests, quizzes, assignments, records, class work and other types of exercises in accordance with the internal evaluation system.

Periodical examinations of various types viz. Quizzes, mid semester etc. shall be held by the concerned teacher during a semester. Normally, one quizz or assignment and mid-semester Examination will be held during the period of each semester at suitable intervals. The date of mid-semester examination shall be announced by the concerned teacher atleast a week earlier. The quizz cannot be conducted in the first 3 weeks of the semester Normally a quizz shall not be repeated once only before the mid-semester examination.

There shall be final written examination of not less than two hours duration at the end of each course offered, covering the entire syllabus in theory and practicals. The practical examination, shall ordinarily be held in the last practical period of the semester. The theoretical aspects of the practicals may also be included in the final theory examination and vice-versa.

The allocation of marks between the theory and practical/ field work shall approximately be in proportion of the number of credit, hours allotted for theory and practical/field work respectively.

| | | |
|---|---|---|
| Weightage | The weightage for various examinations shall be : | |
| Theory | Assignment of quizz | 10% |
| | Mid semester examination | 30% |
| | Final examination | 60% |
| Practical | Record, classwork, field-work, Lab. work, practical excercise etc. | 40% |
| | Final examination | 60% |
| Grading | The details of grading shall be as under: | |

| Percent Marks Obtained | Grade | Significance | Point per credit hour. |
|---|---|---|---|
| 90 and above | A | Excellent | 4 |
| 80 and below 90 | B | Good | 3 |
| 70 and below 80 | C | Fair | 2 |
| 60 and below 70 | D | pass but not satisfactory | 1 |
| less than 60 | F | Failed | 0 |
| Incomplete | I | - | - |
| With drawn | W | - | - |
| Satisfactory | S | - | - |
| Unsatisfactory | US | - | - |

Note: A Post Graduate student securing less than 70% marks shall be awarded F grade in that course. The minimum C.G.P.A. required to be achieved by an Undergraduate & Post graduate student to be promoted to the next higher year of standing shall be 2.00 and 2.50 respectively.

FOR POSTGRADUATE:

A post graduate student shall appear to the written comprehensive examination and viva-voce only after completion of more than 80% course work. The postgraduate candidate is eligible to submit thesis/dissertation only on successful completion of comprehensive examination and the resident requirement. The maximum period for submission of thesis shall be five years from the date of the registration.

M. Sc. thesis will be graded jointly by the Advisory Committee and the external examiner. Allocation of credits for assessment of the thesis shall be as under:

| S. No. | Item of Evaluation | Credit |
|---|---|---|
| 1. | Introduction | 1 |
| 2. | Review of Literature | 1 |
| 3. | Materials and Methods | 1 |
| 4. | Presentation of data | 2 |
| 5. | Discussion | 2 |
| 6. | Summary & conclusion | 1 |
| 7. | Presentation of Language (grammatical and typographical errors), | 1 |
| 8. | Native practical significance recent origin of problem | 1 |
| 9. | General get up of dissertation | 1 |
| 10. | Bibliography | 1 |
| 11. | Viva-voce | 4 |
| | | 16 |

Graduation requirements:

A student shall have to successfully complete a minimum number of credit hours and resident requirement for the award of degree as detailed below; or as prescribed by the Academic counsel from time to time.

| Course | Course duration | Minimum Credits |
|---|---|---|
| B. Sc. (Agriculture) | 7 | 117 credits including 10 credits of internship. |
| B. V. Sc. & A. H. | 9 | 160 credits including 10 credits of internship. |
| B. Tech. (Agriculture) | 8 | 130 credits including 10 credits in plant training. |
| B. Sc. (Home Science) | 6 | 108 credits |
| M. Sc. (Agriculture & M. V. Sc.) | 4 | 50 credits (34 credits for course work and 16 for research) |
| Ph. D. | 4 | - |

The student shall be awarded class as given below depending up on minimum C. G. P. A. obtained in 4.00 point scale. For each failure, 0.01 will be deducted from C. G. P. A. while awarding class.

| Course | I class with distinction * | I class | II class |
|---|---|---|---|
| B. Sc. (Agriculture)<br>B. V. Sc. & A. H.<br>B. Tech. (Agriculture)<br>B. Sc. (Home Science) | 3.60 | 3.00 | 2.00 |
| M. Sc. (Agriculture)<br>M. V. Sc. | 3.75 | 3.25 | 2.50 |

* Students should not have obtained 'F' grade at any stage. Under-Graduate students although securing 2.00 C. G. P. A. having failures and if the C. G. P. A. Works out to be less than 2 after deducing 0.01 for each failure will be declared as pass class.

## 8. ORISSA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY

### Year of introduction 1974-75

Undergraduate studies:

There shall be two semesters in each academic year and the duration of each semester shall ordinarily be 20 to 2[illegible] weeks with at least 100 working days as indicated below. In no case, the number of working days shall be reduced.

1. First Semester - July to December
2. Second Semester - January to May.

The Minimum Credit requirement for registration in each semester shall be 15.

The Maximum credit load shall not exceed 24 credit hours. Ordinarily the work load in a semester shall be 18 to 21 credit hours.

i. The duration of a credit hour shall be 50 minutes, for lecture and/or tutorial class.

ii. The duration of a credit hour shall be 100 minutes, for practical class

iii. Each theory class shall ordinarily consist of 48 students.

iv. Each practical or tutorial class shall ordinarily consist of 16 students per teacher.

Examination

The final semester examination shall be held at the end of the semester. The final examination in theory shall be conducted at a central place for each college in accordance to the schedule prepared and announced by the Dean. Ordinarily, there shall be internal assessment of all examinations and quizzes held under the semester system. However, where Vice-Chancellor considers necessary to get the papers evaluated by external assessment in any course, he may do so in such a manner as he deems proper.

The results of any semester shall be determined on the cumulative results of various quizzes, periodical tests, Lab. and class work and the final examination held during a semester. All quizzes, tests and examinations shall be conducted by means of written papers.

The weightage to be given to various aforesaid tests shall be as follows:

i) Quizzes - 10%
ii) Periodical tests - 20%
iii) Laboratory and Class work records - 20%
iv) Final examinations - 50%

In the case of purely practical nature there will be only practical and oral examinations. In courses, where there are no practicals, there will be assignments carrying 20 marks in place of laboratory and class work records.

The duration of the tests are given below:

i) Quizzes - 10 to 15 minutes
ii) Periodical tests - one period
iii) Final examination - Two hours each for theory and practical.

The cumulative marks obtained by a student during the semester system in various tests and examinations for different courses, shall be assessed on the basis of grade point average and graded alphabetically as follows.:

| Mark Range | Grade Significance | Point per credit hours |
|---|---|---|
| 80 or more | A - Excellent | 4 |
| 70 to less than 80 marks | B - Good | 3 |
| 60 to less than 70 marks | C - Satisfactory | 2 |
| 50 to less than 60 marks | D - Pass; but not satisfactory | 1 |

| | | |
|---|---|---|
| Below 50 marks | F - Fail | 0 |
| Failure to appear the final examination | I - incomplete | - |

The successful candidates after the completion of the graduation requirements who secure an O. G. P. A. of 3. 00 and above without recording 'F' grade in any course shall be classified under first class and all others under second class. Also a student who has repeated any course to improve his O. G. P. A. shall be placed on second class though he obtains an O. G. P. A. of 3. 00 & above. However, irrespective of repeating any course (s) a successful candidate who secures an O. G. P. A. 3. 50 shall be awarded first class.

## 9. PUNJAB RAO KRISHI VIDYAPEETH

The normal full time programme of work in a semester shall be of about 18 credit hours and in no case it shall exceed 21 credit hours. Every student shall attend all the meetings, viz-class room lectures, discussions, laboratory and field practicals, extension education visits/camp study and the meetings with teachers, advisors etc. If a student fails to attend atleast 80% of the above said meetings, he shall not be eligible to appear at the semester end examination.

A student's progress in a course shall be judged in accordance with the course credit and internal evaluation system of education, through periodical examination such as quizzes, mid semester examination, semester end examination, attendance and classwork records maintained by him.

The relative weightage to the various examinations conducted, class work and records maintained during a semester shall be as under:

Theory:

I Quizz - 10% of marks allotted to theory work.

II Quizz - 10% of marks allotted to theory work.

Attendance - 5% of marks allotted to theory work

(Mid - semester examination) 25% of marks allotted to theory work.

(Semester end examination) 50% of marks allotted to theory work.

Practical:

| | | |
|---|---|---|
| Record of class work | : | 20% of marks allotted to practical/field work. |
| Attendance | : | 5% of marks allotted to practical/field work. |
| Mid semester exam. | : | 25% of marks allotted to practical/field work. |
| Semester - end exam. | : | 50% of marks allotted to practical/field work. |

(The 5% of marks allotted to attendance should be given on the percentage of attendance as shown below:)

| | | |
|---|---|---|
| Below 80% of attendance | - | 0 mark. |
| 80% and above but below 84% | - | 1% mark. |
| 84% and above but below 88% | - | 2% marks |
| 88% " " " " " 92% | - | 3% marks |
| 92% " " " " " 96% | - | 4% marks |
| 96% and above | | 5% marks |

Grading:

At the end of each semester a student shall be given course grade namely A, B, C, D or F on the basis of his performance in his assignments, records or class work and mid semester and semester-end examination. The significance of each course grade and the points which it will carry shall be as per details given in the table below:

| % of marks obtained in a course. | Grade | Significance | Point for each credit hours. |
|---|---|---|---|
| 90 - 100 | A | Excellent | 4 |
| 80 - 89 | B | Good | 3 |
| 70 - 79 | C | Fair | 2 |
| 60 - 69 | D | Pass, but not satisfactory | 1 |
| Less than 60 | F | Failed | - |

Note: The fractional percentage shall be rounded off to the next higher integer.

A student must necessarily obtain C. G. P. A. to the extent atleast 2. 00 (in the scale of 4. 00) after satisfactorily completing the requisite courses determined by the Academic Council in order to qualify himself for the award of the B. Sc. (Agriculture) degree.

## 1. INDIAN INSTITUTE OF TECHNOLOGY, BOMBAY

### Courses offered:

B. Tech - 5 years; M. Sc. (Tech.) - 3 years. Each academic year has been divided into two semesters namely first semester and second semester. First semester begins in July and Second Semester in January.

### Credit for a course:

The credit is calculated as follows. For each lecture or tutorial hour per week in a semester, two credits are assigned. For each laboratory hour per week one credit is assigned.

## Assignment and Grading:

The various modes of assessment used for rating a student's performance in a lecture course include the Quiz, the class test (open or closed book), the home assignment, the group assignment, the viva, and the semester end examination. The assessment in a laboratory course depends on turn to turn supervision regular viva, performance in group discussion, laboratory report writing and the end-semester test. For a lecture course, a the semester end examination will account for 50% weightage. For the in semester work, the distribution of weightage among the quizzes, class tests, assignments and viva will be indicated by the course instructor at the commoncement of the semester. For a laboratory course, the end-semester test will account for 20% weightage, and the in semester work for 80%. Absence or gross negligence during in semester work may result in the loss of marks.

## Grading:

In every course taken by a student, he is assigned a grade based on his combined performacen in all the assessments. These grades are described by the letters A, B, C, D, E, F, which carry a qualitative assessment as well as a number equivalent called the grade point, as given below:

| Qualitative Grade | Grade | Grade point |
|---|---|---|
| Excellent | A | 10 |
| Good | B | 8 |
| Fair | C | 6 |
| Satisfactory | D | 4 |
| Poor | E | 2 |
| Very poor | F | 0 |
| Incomplete | I | - |

There are however a four elements of the B. Tech. programme where a (categorization) of students only in the following

2 grades is required. P-Passed; NP - Not passed.

Practical Training NCC/NSO of the II year II semester Elective belong to this category. No grade points are associated with these grades, as such, performance in these courses is not taken into account for the calculation of SPI or CPI.

## Examinations:

Semester end examinations are conducted for each lecture course. Attendance at the semester end examination is compulsory unless bonafide reasons exist. SPI and CPI:

## SPI:

The performance of a student in a semester is indicated by a number called the SPI. The SPI is the weighted average of the grade points obtained in all courses taken by the student during the semester. It is calculated to 2 decimal places.

## CPI:

An up to date assessment of the overall performance of a student from time he entered the institute is obtained by calculating a number called the CPI. It is the weighted average of the grade points obtained in all the courses taken by the student since he entered the institute.

## Minimum SPI requirements:

A student in order to continue his studies at the institute must satisfy the minimum SPI requirement specified below:

| | |
|---|---|
| 4.20 | for the I semester |
| 4.50 | for the II semester |
| 4.75 | for the III semester |
| 5.00 | for the IV and subsequent semesters. |

## Practical Training:

A student is required to undergo 8 weeks of practical training in an approved factory, laboratory works or organization as a part of the requirement of the B. Tech. Programme. This is done in two spells of 4 weeks each after the 6th and the 8th semesters.

Each student has to submit a written report to the co-ordinator concerned with in a week of the re-opening of the institute for the next semester. A viva is also conducted.

NCC/NSO:

One of these two is compulsory for the first two of the 5-year programme except for those who desire to participate in sports.

B. Tech. Project:

Every student has to undertake a project of a professional interest. Each student is required to make a preliminary presentation of his project towards the end of the 8th semester or at the beginning of the 10th semester. Finally an oral examination is conducted after the semester end examinations.

The weightage marks for the various courses:

Preliminary presentation: 25% of the total weightage.

Initiative interest, effort and regularity shown by the student during the project work 25%

Oral Examination 50%

Requirements for the Award of the B. Tech./M. Sc. degree.

The degree of B. Tech or M. Sc. in relevent branch of Engineering, or science is awarded to a student if he has fulfilled the following requirements.

a) He has taken and passed all the prescribed courses under general institutional or departmental requirements.

b) He has satisfied the SPI and CPI requirements.

c) He has satisfied the B. Tech project or M. Sc. Home paper requirements.

d) He has satisfied the requirement of practical training and NCC/NSO

e) He has paid all the institute dues

f) He has no case of indiscipline pending against him.

## AWARD OF CLASSES

A student who has fulfilled all the requirements for the award of B. Tech. degree is placed in one of the following classes.

| | |
|---|---|
| I class with Distinction | CPI equal to or $>$ 8.50 |
| I class | CPI equal to or $>$ 6.50 but $<$ 8.50 |
| II class | CPI equal to or $>$ 5.00 but $<$ 6.50 |

## FOUR YEAR B. Tech. Programme:

### Four Year B. Tech. Programme

On account of implementation of 10 + 2 + 3 pattern of education, it has become necessary to make suitable provision for admission to I. I. T. s of students who have completed 10 + 2 stage In accordance with the decisions taken by the All India Council of Tech. Education and the I. I. T. council, the senate I. I. T. Bombay has recently approved the scheme with details of curriculum of a 4 year programme leading to the (B. Tech.) of this institute in various branches of Engineering for the entrants who would have completed 10 +2 stage or its equivalent. Since the first batch of students for this programme will be admitted only from July 1977 the Bulletin give the curricula & syllabi only for the first two semesters of the programme.

There are mainly 2 types of courses-lecture course and laboratory course. Lecture courses consist of lecture (L) and tutorial (T) hours, but many have practical (P) hours attached in special cases. Laboratory courses consist of practical hours but may have tutorial hours attached in other cases.

The credit 'C' for a course is dependent on the number of hours of instruction per week in that course and is obtained by using a multiplier of unity for laboratory hours. Thus, for e.g. a lecture course having 2 lectures and 1 tutorial per week throughout the semester carries a credit of 6; similarly a laboratory course having one tutorial and three laboratory hours per week through-out the semester carries a credit of 5. Credits are assigned to works visits, seminar and the B. Tech/M. Sc. Project. Practical Training & NCC/NSO are non-credit requirements for the degree.

## Instruction & Assessment

Lecture courses are in general, supported by tutorial instruction in small groups. The tutorial in addition to fulfilling their rolls of personalized two-way, teacher-student contact are used for assessment. The assessments are made continuously through quizzes, class tests, home assignment and the semester end examination.

The assessment in a laboratory course is made through observation of the student at work, viva during laboratory hour s, his journal record and the end semester test.

## Award of Grades

In general,one of the following letter grades is awarded by the course instruction on the basis of the performance of the student over the semester. A-Excellent; B-good; C - Fair; D - Satisfactory; E - un-satisfactory, I - incomplete.

There are however, a few elements of the B. Tech. /M. Sc. where a categorization of students only in the following grades is required. P - passed; N. P.- Not passed.

Practical Training, NCC/NSO and the II year II semester Elective belong to this category. A student obtains the grade

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NP is required to repeat it. (Other rules are common as V year B. Tech. & II year M. Sc. programme).

## 2. INDIAN INSTITUTE OF TECHNOLOGY, DELHI

The following under-graduate, post-graduate and research programmes are offered at the institute.

Under Graduate:

5 year U. G. Programme leading to the degree of B. Tech. is offered in following disciplines.

1. Chemical Engineering
2. Civil Engineering
3. Electrical Engineering
4. Mechanical Engineering
5. Textile Engineering

In addition to these, a five year integrated course leading to the degree of Master of Science (M. S.) in Chemistry and Physics is offered.

Post Graduate

2 year programme leading to the degree of M. Tech. are offered in the various engineering and science disciplines. No programme will, however, be run unless the number of students registered for the programme is six or more.

Master of Science:

(M. Sc.) A 2 year post F. Sc. course leading to the degree of M. Sc. is offered in the Department of Mathematics.

Courses, Credits and Grades:

1. Every course offered by departments will be denoted by two letters and three numbers.

2. The letter symbols for the various departments are: A. M. applied Mechanics; CH - Electrical Engineering, HU - Humanities & Social Sciences, MA - Mathematics, ME - Mechanical Engineering, PH- Physics, TT - Textile Tech.

3. The 3 digits of the number denoting a course will be used with the following criteria.

a) The last digit will be odd for courses given in the first semester, will be even for courses given in the second semester and will be zero for courses given in either semester or both semesters.

b) The first digit corresponds to the year in which this course is normally taken by a student undertaking a 5 year programme. Advanced elective courses which run concurrently with post-graduate programmes have the number 6 for the I digit.

c) The II digit will be used only to identify different courses Example: A course number CE 324 will mean a course offered by the Civil Engineering Department in the II semester and is formally available to undergraduates in the III year of study in I. I. T.

Evaluation of Credit:

1. For courses with lecture and tutorial contact, one credit per lecture/tutorial per week per semester.

2. For courses with lecture, tutorial and laboratory contact, one credit per lecture/tutorial per week per semester, one credit for a minimum of two hours of laboratory or experimental courses per week per semester, two credits for four hours or more of laboratory contact per week per semester.

3. The Maximum credits per course will be restricted to six. If there be a need for a course of any larger amount of credits, it must be established with the prior permission of the BUGS. (Board of under-graduate studies).

Minimum Credit requirements:

A student must register for at least 240 credits out of which he must obtain 'D' grades and above in a minimum of 220 credits in the specific manner prescribed below:

| | |
|---|---|
| Language and Social Science | 20 credits. |
| Basic Sciences | 40 credits (The student shall take a minimum of 8 credits each in physics and chemistry and a minimum of 15 credits in Mathematics) |
| Engineering Arts | 20 credits |
| Engineering Science | 20 credits 40 credits. (The student shall 20 credits take a minimum of 15 credits in other of the groups) |
| Departmental requirements | 100 credits |
| Unspecified | 20 credits |
| Total | 220 credits |

The unspecified credits shall be taken by the student in consultation with his course adviser.

## The Grading System

The grade awarded to a student in any particular course for which he is registered will be based on his performance in the minor and major semester tests, tutorial Quizzes, home work, lab. performance, workshop and drawing office assignments. A specified percent of weightage could be given to punctually, regular attendance etc. The grades that can be awarded are listed below:

| Grade | Grade Point | Description of performance |
|---|---|---|
| A | 10 | Excellent |
| B. | 8 | Good |
| C | 6 | Satisfactory |

| | | |
|---|---|---|
| D | 4 | Marginal |
| U | 2 | Unsatisfactory |
| I | - | Incomplete |
| N | - | Audit |
| W | - | With drawn |

A minimum of two minor written tests of one hour duration each and a major written test of two hours' duration will be held in each course. The major test will be a comprehensive one covering all parts of the course and would be normally held towards the end of the semester. The relative weightage for the minor and major test, lab. performance, tutorial assignments, Quizzes, etc., will be announced by the instructor in the class during the first or second week of the semester. There will be no supplementary examination in the credit system. The semester grade point average (SGPA) is the weighted average of the grade points awarded to a student in the semester and is computed as follows:

$$\text{SGPA} - \frac{\text{(Credit Units) X (Grade points)}}{\text{(Credit Units)}}$$

The Cumulative Grade point Average (CGPA) is the weighted average of grade points awarded to a student in all the semesters he has been in residence at the institute. It should be noted that the grades I, N and W are not taken into account in computing either SGPA or CGPA, but the U gradepoints and the corresponding credit units are included in both SGPA and CGPA.

The minimum credit units of 220 should be completed within a period of seven years. This minimum of 220 would not include the credit units of those courses in which the student has been awarded U grades. As satisfactory performance corresponds to a CGPA of 6.00, a student is required to leave the institute if his CGPA is less than 4.75 in 2 consecutive semesters during the first five semesters. Summer courses, if any, will be considered part of the following semester for purpose of defining, two consecutive semesters. In addition, a student is required to leave the institute at the end of the I semester of residence, if his S.G.P.A. is less than 3.75 at that time.

### M. Sc.

M. Sc. course is run in mathemathics department only. The students admitted to this course will have to register for a minimum of 96 credits of which they should obtain D grades and above in at least 90 credits.

### M. Tech/Post Graduate Diploma

### Evaluation of credits

1). For all lecture courses, one credit per lecture/week/semester will generally be adopted with the restriction of maximum of 3 credits percourse. If there is a need for a course carrying more than 3 credits, it must be established with prior permission of the BPGS. (Board of Post-Graduate Studies).

2) All Lab. & experimental courses will have one credit for a minimum of 2 hours/week/semester or 3 hours per alternate week/semester. Laboratory courses with larger number of contact hours per week/semester up to 6 hours/week will have 2 credits. Any deviation from this in any laboratory course needing contact hours more than 6 per week will have to be fixed by prior consultation with the BPGS.

3) M. Tech. projects shall be assessed and given GPA like any other course. Maximum of 18 credits or a part thereof will be given GPA for calculation of CGPA for the project.

### Credit requirements

The normal requirement for M. Tech degree will be 54 credits of subjects. A full time master's student will be allowed to register for a minimum of 12 and maximum of 18 credits per semester.

2) A part-time master's student will be allowed to register for a maximum of 9 credits per semester. There may be a case in which a project has not more than 9 credits. In such a case, a student may be permitted to take up M. Tech. Projects up to 12 credits in a semester subject to the condition that the student does not take any course credit.

3) Ordinarily an average student for one year diploma course will be expected to have 27/28 credits for the Diploma.

## Specialisation

The areas of specialisation is defined as one subject in which a student earns (a) a minimum of 12 credits to a maximum of 18 credit of 6 credits of laboratory work/minor projects (b) a minimum of 15 credits of course work and (c) a minimum of 6 credits of laboratory work/minor projects. All M. Tech students would be expected to earn a minimum of 6 credits from courses outside their specification.

## Grading

Same as the one for B. Tech. /M. S.

## Pass-Fail Criteria

No student whose CGPA falls below 5. 0 will be permitted to continue in a M. Tech. course. The final results will be announced in the following classes:

| Class | CGPA |
|---|---|
| I with Distinction | 9. 00 or more |
| I | 7. 50 or more (but < 9. 00) |
| II | 6. 00 or more (but < 7. 50) |
| Pass | Below 6. 00 (but < 5. 00).<br>(for diploma only) |

## 5 INDIAN SCHOOL OF MINES, DHANBAD

The School had introduced the Semester System from 1976 for I and II year Under-graduate levelin all the faculties at the first instance.

For Ist degree level this system covers the following faculties:

1. Mining Engineering
2. Petroleum Engineering
3. Mining Machinery
4. Applied Geology
5. Applied Geophysics

The course of studies for the above integrated programmes are divided in 10 semesters for candidates admitted in I-year and 6 semesters for the candidates admitted under make-up or Condensed admission programme.

Every semester course carries a number of definite credits which depends on the actual teaching hours of that semester.

An alphabetical grades are awarded in each course based on the performance of Sessional work, practicals as well as the semester Final Examination. For a course which includes practicals, the relative weightage of sessional, practical, Semester (Final) Examination are 30:25:45 and for other courses 30:70 for sessionals Semester (Final)Examination.

## 3. INDIAN INSTITUTE OF TECHNOLOGY, KANPUR

The academic year of this Institute consists of two semesters. The first semester starts at about the end of July and the second semester starts at about the end of December. There is a summer session that starts in May.

The examination system in the Institute is a continuous process of evaluation normally based on short - tests, two mid-semester examinations and one end-semester examination in addition to performance on homework and laboratory assignments. The student's final grade is based on a weightage of the grades he obtains in the examinations, Quizzes and other assignments.

## 4 INDIAN INSTITUTE OF SCIENCE, BANGALORE

For the Students of the M. E., M. Tech. Degree Courses and

B. E. & Diploma Courses.

## I M.E. and M. Tech. Degree

### Attendance

A student is required to be regular and punctual and to put in a minimum attendance of 75% in each course for which he is registered. The course may comprise of lectures, laboratory, workshop or drawing office work or any combination of them as prescribed. Failure to put in minimum attendance will entail award of an E grade for the course unless the shortage of attendance is condoned on the merits of the case, in which case the subject may be repeated in a subsequent term.

### Examination

The final examinations in each term will normally be held during the two weeks preceding the end of the term.

Attendance at the terminal examinations is compulsory and if a student absents himself from any of these, he shall be deemed to have obtained zero marks in the papers for which he absented himself. Exemption may be granted in case of serious illness supported by a certificate by the Institute Medical Officer. In such a case, he will have to take a separate examination when arranged.

### Sessional Work

The sessional work shall consist of class tests, mid-term examination, home-work assignments etc., as indicated by the instructor. Absence from the class tests, mid-term examination etc., or late submission of homework assignments may result in the loss of marks allotted therefore.

### Assessment

a. In the assessment for a subject in a term unless otherwise approved by the Deans, the final examination at the end of the term will account for 50% and the sessional work for 50% of the total marks. The distribution of sessional marks between homework assignments, class tests and mid-term examinations etc. will be indicated by the Instructor at the commencement of the course.

b. In every subject taken by the student, he will be assigned a grade based on his combined performance in the final examination and the sessional work. These grades will be described by the letters, A, B, C, D, and E, which carry a qualitative assessment as well as a number called the grade point as given below:

| Grade | Qualitative Assessment | Point value of Grade |
|---|---|---|
| A | Excellent | 4 |
| B | Good | 3 |
| C | Satisfactory | 2 |
| D | Marginal | 1 |
| E | Poor | 0 |

c. Based on the grades obtained by the candidate in the course he is registered for, a Grade Point Average (GPA) will be arrived at as follows:

1. Multiply the number of credits for each course by the point value of grade obtained by students in that course and then add all the products.
2. Divide this product-sum by the total number of credits for the term.

$$\text{i.e. GPA} = \frac{(\text{Credits X Point value of grade})}{\text{Credits}}$$

The GPA for the subjects taken in a term is the Term GPA. The GPA for all subjects taken upto any stage is the Cumulative GPA (CGPA) at that stage.

d. A student who obtains a GPA of less than 1.6 in his first term at the Institute will not be permitted to continue his course of studies any further. A student who obtains a term GPA of less than 2.0 (B.E. 1.8, Dip.1.8) in the subsequent term/s except in the final term, will not be permitted to continue courses of studies any further. In the final term, what is relevant is the CGPA obtained by the student and the project grade to consider whether the student has completed satisfactorily all the requirements for the award of the degree or otherwise.

A student whose GPA falls below 2.2 (B.E. 2.0, Dip.2.2) in any term is required to unload his course work below the normal 16 credits in the following term, so that he may improve his grade point average. For purposes of this rule, term GPA is reckoned only in respect of grade points obtained for the courses.

Notwithstanding anything that has been said about the minimum requirements on GPA for continuing studies at the Institute, a student shall not obtain E grade in more than 2 (B.E.-3, Dip-3) subjects during the study for the M.E. or M.Tech. degree. If at any time during his studies he has acquired E grade in 3 (B.E.4, Dip-3) or more courses, he will be asked to withdraw from the course.

For award of the degree, a student must:

i) complete the minimum requirement of 64 (B.E. (96) Dip-32) credits inclusive of project;

ii) obtain a CGPA of 2.2 (B.E.(2.0) Dip-2.2) or more in the course and

iii) obtain a grade 'C' or higher in the project

## Distinction

A candidate will be declared to have passed with distinction, if he attains:

i) Grade 'A' in project and course (For B.E. only) GPA of 2.9 or more, or

ii) Grade 'B' in project and course GPA of 3.1 or more, or

iii) Grade 'C' in project and course GPA of 3.4 or more.

Note: If a candidate secures grade 'D' in project work, he will be given one more chance to re-do the project work and resubmit it for another evaluation. A candidate who secures grade 'E' in project work will have to leave the Institute.

## Permissible course Load During a Term:

The average number of credits required of a student during a term is 16. With the approval of his adviser, any number of credits between 12 and 18 (both inclusive) is permitted. A superior student who has proved his competence by securing a GPA of not less than 3.4 with all credits A or B during a term in which he carried 16 or more credits may be permitted to register upto 21 credits in the following term. He may continue to register upto 21 credits provided he maintains a GPA for 3.4 or more with all grades either A or B.

It is open to the authorities of the Institute to advise a student who is unable to complete the course requirements in the normal period, to go in for an extra term provided the department identified in advance that the student requires an extra term to complete the course requirements and his academic performance is considered satisfactory by the department.

Likewise, it is also possible for a student to go at a slower rate if he is unable to complete the course requirements in the normal period, by putting an extra term for completion of the course requirements in all aspects provided the student indicates his intention in advance through his adviser and supported by the department with reasons at the end of the II term and his academic performance in the I and II terms is considered satisfactory by the department.

It is open to the students to take advantage of the Summer Term organised during the months of May and June every year to register for courses and complete the requirements for the award of the degree earlier. During the Summer Term while registration for the courses will be permitted, no registration for projects will be permitted. Only spill over of projects, if any, into Summer Term will be permitted provided the project registration had taken place during the earlier term.

The stipulation of minimum number of credits shall not apply to the extended term as also to the Summer Term.

## General

Immediately after the students join the Institute, they will be evaluated for their proficiency in English and in case they are found deficient, they will have to undergo a language course in English. This is usually of one term duration.

## 6. MADURAI INSTITUTE OF SOCIAL WORK

(a P. G. course affiliated to Madurai University)

The M. I. S. W. was founded in 1966 to meet a long felt need of the southern districts of T. Nadu. This P. G. institution imparts scientific professional education and provides practical training in social work to youngmen and women to equip themselves for various positions in different fields of social welfare.

In addition to this, the one year post M.A. Diploma course in social rehabilitation trains the participants with competent knowledge and skills of social work.

### Admission

Candidates who have completed any P. G. degree of Madurai University or an examination of any other university as equivalent to are eligible to pursue this course. Preference will be given to candidates with degree/diploma in social sciences

### Scheme of Education

The scheme of Education for social rehabilitation falls into 3 divisions (a) class instruction (b) field work instruction and practical training. (c) research. The course of study extends over a period of one year consisting of two semesters.

### Scheme of Examination

Semester I

| | | | |
|---|---|---|---|
| 1. | Theory (Part A) | 100 marks | |
| 2. | Theory (Part B) | 200 marks | 500 marks |
| 3. | Part C | 200 marks | |
| Semester II | | | |
| 1. | Theory Part (A) | 100 marks | |
| 2. | Part B | 100 marks | 500 marks |
| 3. | Part C | 100 marks | |
| | Project Report | 200 marks | |
| | | Total | 1000 marks |

Examination fees:

Fees for the whole examination including the project report will be Rs. 25/-

Passing minimum

Candidates shall be declared to have passed I semester course, if he/she secures not less then 50% in both theory and practical work put together. All other candidates shall be deemed to have failed in I semester course.

A candidate shall be declared to have passed the II semester course if he/she secures not less than 50% in both theory and practical work put together. All other candidates shall be deemed to have failed in II semester course.

A candidate shall be declared to have passed to project report if he/she secures not less than 50% of marks.

Classification of successful candidates:

Successful candidates who obtain not less than 50% of the total marks shall be placed in the II class, and those who obtain not less than 60% of the total marks irrespective of their passing the paper in more than one attempt shall be placed in the I class; candidates securing not less than 75% of the total shall be declared to have passed the examination with distinction.

## Evaluation of the course

Evaluation of the course shall be by internal assessment except for project report.

There will be internal and external evaluation for Project Report to be submitted at the end of II semester. The internal evaluation shall be by experts from M. I. C. I. and experts from Social Work Field.

## Prospects

Candidates who successfully complete the course may be absorbed by M. I. C. I.

## 7. TATA INSTITUTE OF SOCIAL SCIENCES

This is a post-graduate institute offering M. A. degree in (i) Social work; (ii) Personnel Management and Industrial Relations, M. Phil., and Ph. D. The semester system for the M.A. degree Programme has been introduced by this institute in 1974-75.

## Attendance

Regular attendance in the class as well as field work and the fulfilment of required assignments are expected of all students.

## Field Work

"Knowing" does not automatically result in the ability of "doing" so necessary for professional development. Therefore, a distinctive feature of the instructional programmes at the institute is the emphasis laid on field work as an integral part of the total curriculum. The content of field work is planned to provide an orderly sequence of learning supervised field work, at least 15 hours per week, is required of all students. Field work is organized as concurrent field work and block field work. During the first year, concurrent assignments are given in case work and group work for students enrolled for M.A. degree programme in social work, In the second year, students are placed for concurrent field work in their specialisation according to the specific requirements of each field.

For students enrolled for the personnel management and Industrial Relations Programme placements are made in industrial organisations. In addition every student is required to complete a full time block field work placement of four weeks in the month of April after the IV semester examination.

## Project Report

During the beginning of the second semester, students who opt for research project select their topics in consultation with the members of the Faculty in the field of their specialization

## Examination

Students must be regular in attendance and pass periodical tests as well as comprehensive examinations. In the final evaluation of a student for each course due consideration will be given to the student's contributions to class room discussions, written reports, reading and other assignments. There may be no written examination in some courses and the student may be evaluated on the basis of assignments.

## Requirements for passing

Students work will be evaluated in grades. The grades and their point equivalents are as follows:

| | | | |
|---|---|---|---|
| O | Outstanding | 6 | points |
| A | Very good | 5 | " |
| B | Good | 4 | " |
| C | Average | 3 | " |
| D | Below Average | 2 | " |
| E | Poor | 1 | " |
| F | Very poor | 0 | " |

Each lecture course will carry one credit per hour per week.

The field work for ar year will carry 12 credit hours, the Research Project four credit hours and viva-voce will carry 2 credit hours.

The G. P. A. for a semester/year programme will be calculated by $\frac{(GC)}{C}$ where 'G' is the point equivalent of the grade obtained by a student in a course and 'C' is the number of Credit hours of the course.

To pass an examination a student should get at least a D grade in individual courses including field work, Research Project (where applicable) and viva-voce and should maintain a minimum grade point average of 2.5 in each semester. In addition the student should complete his block field work satisfactorily. A student will be eligible for block field work only on successful completion of concurrent field work.

A student who is awarded an E or F grade in an individual course will be considered to have failed in that course.

## Scheme of Examinations

a. (M.A. degree in Social work)

The total credit hours for this programme will be so divided equally between the I year and II year, as detailed below:

### I year.

| | |
|---|---|
| Basic course | 26 |
| Specialization course | 2 |
| Field work | 12 |

### II year

| | |
|---|---|
| Specialisation courses and Basic courses opted. | 22 |
| Project Report or Additional Courses | 4 |

| | |
|---|---|
| Field work | 12 |
| Viva-voce | 2 |
| Total | 80 |

b. M.A. degree in personnel Management and Industrial relations

i) Scheme of Examination : Total credit hours = 80 each
year 40

| | | |
|---|---|---|
| I year | Theory course | 28 |
| | Field work | 12 |
| II year | Theory Course | 22 |
| | Field work | 12 |
| | Project Report | 4 |
| | Viva-voce | 2 |
| | Total | 80 |

## 8. GANDHIGRAM RURAL INSTITUTE

"The semester period in this Institution may contain 108 working days exclusive of Examinations. The first semester may begin on the first of July every year. The Second Semester may begin on the 15th December of every year and will end by April 30th of the following year which also includes Examinations. The Institute may reopen on June 16th. May 1st to June 15th may be treated as Summer Vacation. The teaching Faculty will report for duty from June 15th onwards."

The lecturer (s) concerned will prepare the course outline in his subject indicating the units of study, the techniques of teaching he is going to adopt during the Semester, the text books, additional readings, assignments etc., and date wise scholastic work including date of tests, quiz., practicals, field work and mode of evaluation for the students information and benefit; and orient them to these techniques on the first day of the Semester. Copies of the course on these may be distributed to the students as record to follow the Semester.

The syllabus should be delimited unit wise under each course for each subject. The delimited scope of the syllabus should indicate the skills knowledge, application, synthesis etc., expected to be developed/acquired by the student. Based on the delimited scope of the unit question bank should be built up. Extension work, practical work, action research possible should also be indicated unitwise in the syllabus.

## Scheme of Evaluation

Evaluation shall be based on external and internal assessment.

The ratio of external and internal assessment shall ordinarily be 50:50 for theory papers and 50:50 for practical work.

The external examination shall be conducted by the Institute at the end of each semester in November and May. The internal assessment shall be done by the Department concerned; question papers for the external examination shall be set by external examiners. Scripts of each external examination subject shall be valued by two examiners one external and one internal.

The question paper for the written test shall contain items to test skills, knowledge, comprehension, application, analysis, synthesis and other objectives with reference to the delimited scope of the syllabus. It may include problem oriented questions, in addition to the usual essay type questions. There need be no choice for short answer type question. Internal choice may be offered for other types of questions.

There shall be a separate paper minimum of 40% for a pass for each theory paper, in the aggregate and there shall be a separate minimum of 35% for a pass at the Internal and external evaluation.

There shall be a separate minimum of 40% for a pass for each practical examination in the aggregate of both internal and external evaluation.

There shall be no supplemental examination for the failed

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students under the semester system i. e., If a candidate fails in a paper (s) of November Semester examination he will have to reappear in that paper (s) in the next November Examination for obtaining a pass. Similarly if a candidate fails in a paper (s) of May Semester examination, he will have to reappear in that paper(s) in the next May examination.

If a student fails in the internal assessment in a subject he/she has to reappear for the internal tests etc. according to the programme arranged for such students by the departments concerned.

Failed candidates will be permitted to appear under the same syllabus for 3 attempts including the first.

If a candidate fails in the theory paper in a subject and passes in the practical in the same subject in a particular semester, he has to reappear only for the theory paper and he will be given a pass certificate as regards the practical and vice versa.

If a student who has registered for the Institute examination is absent, his marks in the external examination shall be taken as Zero and the results declared on this basis. However any student who has already obtained the passing minimum for the practical examination in the Internal assessment itself and is unable to take the Institute practical examination owing to illness or for any other valid reason he may be permitted to appear for this examination at the corresponding semester next year provided he applies for it through the head of the department in time. There shall be no detention from one semester to the next..

Internal Assessment

The semester system provides opportunities to the teachers for continuous assessment and evaluation of the student.

This assessment may be based on the following:

1. Written Tests
2. Seminars/Discussion
3. Quizzes
4. Assignments/attendance

5. Field Work/Contribution to village life through Extension.
6. Practical work.

For the uniformity of assessment, 3 tests 3 assignments and 3 short quizzes, 2 Seminars may be conducted during each semester and the marks be assigned to them as follows:

| | |
|---|---|
| Written tests | 20 marks |
| Seminars/Quizzes/ Discussions | 10 marks |
| Assignments | 10 marks |
| Attendance and Field work | 10 marks |
| | 50 marks |

In order to encourage improvement in the performance of students and to allow for absence for tests due to sickness etc. it may be fixed that out of the three tests conducted the average of the two best marks may be taken for assessment.

Three tests in a subject may be conducted during a semester, spaced at intervals of about a month, and all the test scores shall be sent to the Institute in time. The average of the two best of the three tests shall be taken for assessment.

If two or three teachers are handling portions of a subject constituting a single paper, they may each hold three one hour tests during a semester, spaced a month apart. However the average of all the tests held at the end of each month shall be taken as one test mark. (alternatively all the teachers may join together and give a single 3 hour test at the end of each month).

Supplemental tests, and quizzes may be conducted by the teacher for students who could not attend these due to valid reasons. However, if a student attends only one test, the marks in the other test should be taken as zero and average of two tests taken as the final marks for the tests. Similar procedure will be adopted for quizzes and assignments.

Fractions of marks obtained should be shown as they are.

But the total for each subject should be rounded off to the nearest integer for the maximum of 50.

Each department should keep a file of all questions and send a copy of them to the examination cell of the Institute. This would serve as an effective feed back and would help in building up a question bank.

Quiz items just as the written test should be based upon the spectrum of abilities from the lower to higher levels. These quizzes would adequately cover the essential principles and more recent concepts in various disciplines. Here recall type of questions should be minimised. These may be valued by the students themselves but not by mutual exchange.

The topics for the seminars for the semester should be announced before the beginning of the Semester so as to enable the students to prepare for them by collecting data from different sources. Further, this would give an opportunity for all the participants of the Seminar to be ready for a meaningful participation and discussion.

Written assignments may be given periodically, based on library work and other related activities.

## Practicals

Practical work may be assessed on the following:

a) Handling equipment and material
b) designing experiments
c) conducting experiments
d) tabulating and classifying the data
e) analysing and interpreting data
f) formulating hypothesis and
g) drawing tentative inference.

Students should be trained in developing scientific observation and recording these observations systematically.

Laboratory work shall be assessed continuously in every practical class.

The ratio of Internal to External Assessment shall be 50:50

There shall be a Institute Examination, with one external and one internal examiner present. The Internal examiner will be the teacher from the department who has handled the class. For the major subjects there shall be a practical examination from second Semester.

The Internal assessment will be based on the laboratory work and the observation note book.

# TWO

# SEMESTER SYLLABUS, TEACHING/LEARNING/EVALUATION METHODS, ILLUSTRATIVE EXAMPLES

1. UNIT TITLE : MATHEMATICS

2. UNIT LEVEL : FIRST DEGREE LEVEL

3. UNIT VALUE : ONE

4. DESIGN LENGTH : 60 HOURS

5. AIMS OF THE UNIT

To consolidate basic principles and establish a common base for further progress, taking into account the wide variety of approaches to mathematics previously encountered at earlier stages in education.

6. SPECIAL NOTES

For some students not all the objectives in this unit may need to be taught, some already having been met by the students as a result of study in school.

## 7. ASSESSMENT SPECIFICATION

The following gives the unit breakdown, by topic and types of learning, as a key to the production by a college of its assessment specification for this unit.

| Unit topic area | Topic as % of assessment | Motor Skills | % of total assessment | | | |
|---|---|---|---|---|---|---|
| | | | Intellectual skills | | | |
| | | | Information | Comprehension | Application | Invention |
| A | 20 | | 6 | 14 | | |
| B | 10 | 4 | 2 | 4 | | |
| C | 25 | | 5 | 15 | 5 | |
| D | 10 | | 2 | 8 | | |
| E | 10 | | 2 | 8 | | |
| F | 15 | | 5 | 10 | | |
| G | 10 | | 3 | 7 | | |
| | | | | | | |
| | | | | | | |
| Percentage of assessment for entire unit → | | 4 | 25 | 66 | 5 | |

## 8. UNIT CONTENT

The unit topic areas and the general and specific objectives are set out below, the unit topic areas being prefixed by a capital letter, the general objectives by a non-decimal number, the specific objectives by a decimal number. THE GENERAL OBJECTIVES GIVE THE TEACHING GOALS AND THE SPECIFIC OBJECTIVES THE MEANS BY WHICH THE STUDENT DEMONSTRATES HIS ATTAINMENT OF THEM. Teaching staff should design the learning process to meet the general objectives. The objectives are not intended to be in a particular teaching sequence and do not specify teaching method but, for example, practical work could be the most appropriate teaching method for the achievement of the objectives.

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ALL THE OBJECTIVES SHOULD BE UNDERSTOOD TO BE PREFIXED BY THE WORDS: THE EXPECTED LEARNING OUTCOME IS THAT THE STUDENT:

## A. MANIPULATING NUMBERS

1. Applies the four basic arithmetic operations to expressions involving integers and fractions.

1.1 Performs calculations including addition, subtraction, multiplication and division, involving positive and negative integers, lowest common multiple and highest common factor.
1.2 Verifies numerically the law $a + (b + c) = (a + b) + c$; $a(bc) = (ab)c$.
1.3 Verifies numerically the law $a + b = b + a$; $ab = ba$.
1.4 Verifies numerically the law $a(b + c) = ab + ac$.
1.5 Defines numerator and denominator of a fraction.
1.6 Simplifies fractions by cancellation.
1.7 Recognises that cencellation or division by zero is not permissible.
1.8 Adds, subtracts, multiplies and divides fractions, and simplified results.
1.9 Relates ratio and proportion to fractions.
1.10 Solves problems involving more than one of the

operations in 1.8

1.11 Simplifies expressions involving fractions using precedence rules for brackets and basic arithmetic operations.

2. Applies the four basic arithmetic operations to expressions involving decimals.

2.1 Recognises a decimal fraction.
2.2 Converts a fraction to a decimal and vice versa.
2.3 Recognises a recurring decimal and distinguishes between terminating and non-terminating decimals.
2.4 Reduces a decimal correct to a specified number of decimal places.
2.5 States a decimal number correct to a given number of significant figures.
2.6 Converts fractions and decimals to percentages.
2.7 Adds and subtracts decimal numbers.
2.8 Multiplies and divides two decimal numbers giving answers to an appropriate number of decimal places.

3. Evaluates expressions involving whole number indices.

3.1 Defines the terms base, index, indices, powers, reciprocals, square roots in terms of $a^n$ $(a > 0)$.
3.2 Applies the following rules, where m and n are positive integers $a^m a^n = a^{m+n}$

$$\frac{a^m}{a^n} = a^{m-n}$$

$$(a^m)^n = a^{mn}$$

3.3 Deduces that $a^0 = 1$ for all a, and that $a^{-n} = 1/a^n$.

4. Expresses numbers in standard form and binary form.

4.1 Expresses a denary number in the standard form of mantissa and exponent, e.g. $1.234 \times 10^5$
4.2 Converts to normal decimal form a number given in standard form.
4.3 Adds and subtracts two numbers given in standard form

4.4 Expresses a positive integer, less than 64, in binary form.
4.5 Converts a positive binary number to denary
4.6 Adds two positive binary numbers
4.7 Relates binary digits to on/off mode.

## B. CALCULATIONS

5. Ensures that answers to numerical problems are reasonable.

5.1 Limits any answer to a numerical problem to a reasonable number of significant figures.
5.2 Questions the validity of any solution to a physical problem and rejects an answer which is not feasible.
5.3 Estimates the approximate value of arithmetic expressions.
5.4 Repeats the calculation if results do not agree with approximation obtained in 5.3

6. Understands and uses 4 figure tables.

6.1 Determines the square, square root and reciprocal of a 4 figure number using the respective tables.
6.2 Defines logarithm to base 10
6.3 Determines, from tables, the logarithm of any positive number.
6.4 Multiplies and devides two numbers using log tables.
6.5 Deduces that the logarithm of unity is zero
6.6 Calculates the reciprocal of a number using log tables.
6.7 Calculates the value of a number raised to a positive integral power.
6.8 Calculates the square root of a positive number using log tables.
6.9 Evaluates simple mathematical expressions relevant to Level I technology using log tables.
6.10 Recognises limitations of accuracy of tables.

7. Uses a slide rule for simple calculations.

7.1 Identifies the parts of a slide rule.

7.2 Multiplies and divides numbers.
7.3 Determines reciprocals, square and square roots using appropriate scales.
7.4 Evaluates expressions including multiplication, division, reciprocals, squares and square roots.

8. Performs basic arithmetic operations on a calculating machine.

8.1 Adds, subtracts, multiplies and divides numbers using a calculator (see 1.1).
8.2 Calculates the value of a number raised to an integral power.
8.3 Evaluates the reciprocal of a positive number.
8.4 Evaluates expressions arising from realistic problems in Level I units using more than one of 8.1 to 8.3.
8.5 Compares the advantages and disadvantages of 4 figure tables, slide rules and calculators.

## C. ALGEBRA

9. Uses basic notation and rules of algebra.

9.1 Represents quantities by numbers and letters.
9.2 Simplifies expressions involving symbols and numbers using:

  a. the 4 arithmetic operations of addition, subtraction multiplication and division.
  b. the commutative, associative and distributive laws
  c. the laws of indices
  d. the precendence in the use of brackets and arithmetic operations.

10. Multiplies, divides and factorises algebraic expressions involving brackets.

10.1 Multiplies an expression in brackets by a number, a symbol or by another expression in a bracket.

10.2 Factorises expressions by:

a. extraction of a common factor
e.g. $ax + ay$

$a(x + 2) + b(x + 2)$

b. grouping, e.g. $ax - ay + bx - by$

11. Solves, algebraically, simple and simultaneous equations.

11.1 Distinguishes between an algebraic expression and an equation.
11.2 Maintains the equality of a given equation whilst applying any arithmetic operations.
11.3 Solves linear equations in one unknown
11.4 Constructs and solves simple equations from data derived from experimental work in other subjects at this level.
11.5 Solves simultaneous linear equations in two unknowns.

12. Evaluates and manipulates formulae.

12.1 Evaluates, by substitution of given data, formulae such as:

$V = IR$, $v = u + at$, $A = \pi r^2$, $V\ 3^1\ \pi\ r^2h$.

$T = 2\pi\sqrt{\frac{L}{g}}$, $F = \frac{gm_1m_2}{d^2}$

$L = L_0 (1 + \alpha t)$............or other formulae from level I units.

12.2 Transposes formulae of the types shown in 12.1

D DIAGRAMATIC REPRESENTATION OF RELATIONSHIPS

13. Uses suitable graphs and other diagrams to illustrate one-to-one relationship.

13.1 Converts given data into another system of related units.
13.2 Relates a set of values on one scale to a corresponding

values on a parallel scale.
- 13.3 Uses a given straight line to find corresponding pairs of values on the two axes.
- 13.4 Identifies 13.1, 13.2 and 13.3 as examples of one-to-one mappings between sets of given or calculates values.
- 13.5 Applies 13.4 to physical quantities which are directly proportional (e.g. Hooke's Law).
- 13.6 Defines a right handed system of axes.
- 13.7 Determines suitable scales from given data.
- 13.8 Defines and labels exes.
- 13.9 Plots a point accurately given its coordinates.
- 13.10 Draws a straight line to fit points which satisfy a linear law.
- 13.11 Reads values from a straight line graph.
- 13.12 Determines gradient of a straight line graph.

## E. STATISTICS

14. Collects represents and interprets statistical data.

- 14.1 Collects data by counting, measuring, from practical work in other Level I subjects.
- 14.2 Tabulates and groups the data into an appropriate number of equal intervals.
- 14.3 Draws a tally diagram.
- 14.4 Represents the relative frequency percentages of the data by:

  a. 100% bar chart
  b. pie diagram

- 14.5 Defines frequency and relative frequency percentage.
- 14.6 Represents the frequencies by:

  a. pictograms
  b. horizontal or vertical bar charts.

- 14.7 Draws a histogram to represent a given set of data.
- 14.8 Labels fully any diagram (see 14.5, 14.6, 14.7)/
- 14.9 Interprets descriptively the data represented bya given diagram.

## F GEOMETRY

15. Understands the angle relationship associated with parralel and transverse lines.

    15.1 Defines degree, as 1/360th of a revolution and minute as 1/60th of a degree.
    15.2 Recognises acute, obtuse, reflex and right angles.
    15.3 Identifies vertically opposite pairs of angles.
    15.4 Identifies given parallel lines and a transverse:

        a. alternate angles
        b. corresponding angles
        c. interior angles
        d. supplementary angles.

    15.5 Identifies parallel lines through relationship of given pairs of angles.

16. Understands the types of properties of triangle.

    16.1 States the angle sum of a triangle.
    16.2 Identifies types of triangles as:

        a. acute angled
        b. right angled
        c. obtuse angled
        d. equilateral
        e. isosceles.

    16.3 Identifies complementary angles.
    16.4 Calculates any third side of a right angled triangle using the theorem of Pythagoras.
    16.5 Constructs a right angle using the sides of 3 : 4 : 5 triangles.
    16.6 Compares two triangles for similarity or congruency
    16.7 Determines an unknown side or an angle of a second triangle using 16.6
    16.8 Constructs a triangle given one of the following:

        a. three sides
        b. two sides and included angle
        c. one side and two angles
        d. one side, hypotenuse and right angle

17. Understands the geometrical properties of a circle.

    17.1 Identifies radius, diameter, circumference, chord, tangent, sector, segment, and arc of a circle.
    17.2 Solves simple problems relating circumference, radi radius and diameter of circles.
    17.3 States the relationship between angle at circumference and angle at centre of circle.
    17.4 Recognises the angle between tangent and radius of circle is a right angle.
    17.5 Defines the radian.
    17.6 Converts degrees and minutes to radians and vice versa.
    17.7 Expresses angular rotations in multiples of $\pi$ radians.
    17.8 Solves problems involving arcs and angles measured in radians.

18. Calculates areas of plane figures and volumes of common solids using given formulae.

    18.1 Demonstrates that a quadrilateral is a four sided figure which can be split into two triangles.
    18.2 Defines the properties of the following plane figures, relating to sides, angles and diagonals:

        a. rectangle
        b. square
        c. parallelogram
        d. rhombus
        e. trapezium

    18.3 Uses given formulae to calculate areas of:

        a. square
        b. rectangle
        c. parallelogram,
        d. circle
        e. semi-circle

    18.4 Uses given formulae to calculate the volume of:

        a. cylinders,
        b. prisms

c. cones
d. pyramids
e. spheres.

18.5 Uses given formulae to calculate the surface areas of:

a. cylinders
b. prisms

18.6 Calculates the volumes of solids constructed from hemispherical, conical, cylindrical and prismatic parts.

## G. TRIGONOMETRY

19. Solves right angled triangles for angles and length of side using sine, cosine and tangent ratios.

19.1 Sketches right-angles triangle from given data.
19.2 Defines sine, cosine, and tangent ratios for acute angles.
19.3 Reads, from 4 figure tables, the three trigonometrical ratios of a given acute angle.
19.4 Determines from tables an acute angle given its sine, cosine or tangent
19.5 Calculates the fractional or surd forms of the 3 trigonometrical ratio for angles 30°, 45° and 60°.
19.6 States the relationship:

$\cos\ \theta = \sin\ (90 - \theta)$
$\sin\ \theta = \cos\ (90 - \theta)$.

19.7 Solves problems involving trigonometric ratios and / or Pythagoras's theorem.

20. Sketches and identifies sine and cosine curves.

20.1 Sketches a sine wave, over the complete cycle by relating the angle of a rotating unit radius to the vertical projection.
20.2 Sketches a cosine wave, over one complete cycle by relating the angle rotating unit radius to the horizontal projection.

1. UNIT TITLE : ENGINEERING SCIENCE

2. UNIT LEVEL : FIRST DEGREE LEVEL

3. UNIT VALUE : ONE

4. DESIGN LENGTH : 60 HOURS

5. CREDITS FOR UNITS :

   First Degree Ancillary Level in Physics, Physics with Chemistry, Building and Engineering Science, General Science, Physical Science.

6. AIMS OF THE UNIT:

   To develop an understanding by the student of the fundamental engineering science concepts which will provide a base for further studies in technology.

7. SPECIAL NOTES:

   For some students not all the objectives need to be taught some already having been met by the students as a result of study in school.

## 8. ASSESSMENT SPECIFICATION

The following gives the unit breakdown, by topic and types of learning, as a key to the production by a college of its assessment specification for this unit.

| Unit topic area | Topic as % of assessment | Motor Skills | % of total assessment | | | |
|---|---|---|---|---|---|---|
| | | | Intellectual skills | | | |
| | | | Information | Comprehension | Application | Invention |
| A | 15 | | 10 | 5 | | |
| B | 40 | 5 | 10 | 25 | | |
| C | 15 | | 5 | 10 | | |
| D | 30 | | 15 | 15 | | |
| E | | | | | | |
| F | | | | | | |
| G | | | | | | |
| H | | | | | | |
| I | | | | | | |
| Percentage of assessment for entire unit → | | 5 | 40 | 55 | | |

## 9. UNIT CONTENT

The unit topic areas and the general and specific objectives are set out below, the unit topic areas being prefixed by a letter, the general objectives by a non-decimal number, the specific objectives by a decimal number. THE GENERAL OBJECTIVES GIVE THE TEACHING GOALS AND THE SPECIFIC OBJECTIVES THE MEANS BY WHICH THE STUDENT DEMONSTRATES HIS ATTAINMENT OF THEM. Teaching staff should design the learning process to meet the general objectives. The objectives are not intended to be in a particular teaching sequence and do not specify teaching method but, for example, practical work could be the most appropriate teaching method for the achievement of the objectives.

ALL THE OBJECTIVES SHOULD BE UNDERSTOOD TO BE PREFIXED BY THE WORDS: THE EXPECTED LEARNING OUTCOME IS THAT THE STUDENT:

## A. MATERIALS

1. Describes the structure of matter.

1.1 Describes the atom as the basic building block of matter.
1.2 Describes the molecule as an independent group of atoms bonded together.
1.3 Explains the terms elements and compounds in terms of atomic composition.
1.4 Distinguishes compounds from mixtures.
1.5 Gives three examples of each of the following:

a. elements
b. compounds
c. mixtures

1.6 defines the phases of matter, i.e.

a. solids
b. fluids
and subdivides fluids into liquids and gases.

1.7 Gives examples of the conversion of matter from one phase to another.

2. Understands the nature of metallic substances.

   2.1 States five properties characteristic of metals.
   2.2 Lists five typical metallic elements.
   2.3 Explains why metals are rarely used in the pure state.
   2.4 Defines an alloy.
   2.5 Names two alloys composed of metallic elements
   2.6 Names two alloys which include a non-metallic element.

3. Describes oxidation and reduction.

   3.1 States that air is a mixture mainly of oxygen and nitrogen.
   3.2 Describes how material gains mass when heated in air and that oxygen is taken from the air by the element.
   3.3 Defines oxidation.
   3.4 Uses simple chemical formulae to illustrate oxidation.
   3.5 Defines reduction as the converse process to oxidation.
   3.6 Gives two examples of the obtaining of a metal from an oxide ore.
   3.7 Gives two examples of the presence of impurities in a metal obtained. from an oxide ore.

4. Understands the nature of non-metallic materials

   4.1 Lists typical naturally occurring non-metallic materials.
   4.2 Compares 'natural' with 'man-made' non-metallic materials.
   4.3 Defines a plastics material
   4.4 Defines a polymer
   4.5 Distinguishes between thermoplastics and thermosetters and gives two examples of each.
   4.6 Compares the general properties of plastics and metallic materials.

## B. DYNAMICS AND ENERGY

5. Understands fundamental and derived metric units.

5.1 States the fundamental units of length, mass and time in SI.
5.2 States the values of the prefixes: pico, nano, micro, milli, kilo and mega.
5.3 Defines density and its units
5.4 Defines relative density
5.5 Solves simple problems relating to mass, volume and density of solids.
5.6 States that a litre is a cubic decimeter.
5.7 Measures the density of solids and of liquids.

6. Solves problems involving distance, time, velocity and acceleration.

6.1 Defines speed
6.2 Calculates average speed from given time and distance data.
6.3 States the difference between speed and velocity
6.4 Plots straight-line distance-time graphs.
6.5 Calculates the gradient of such graphs and interprets the slope as speed.
6.6 Defines acceleration
6.7 Plots straight-line velocity - time graphs.
6.8 Calculates the gradient of such graphs and interprets the slope as acceleration.
6.9 Solves problems using the equation distance = average velocity x time.
6.10 Calculates distance from the area under velocity-time graphs.
6.11 Defines the radian
6.12 Converts revolutions and/or parts of a revolution to radians and vice-versa.
6.13 Converts a given angular velocity in rev/min to rad/s and vice-versa.
6.14 Draws angular velocity-time graphs for motion with constant angular acceleration.
6.15 Solves simple problems involving distance, time, lin linear velocity, angle turned, uniform linear and univorm angular acceleration, using appropriate diagrams.

7. Solves problems involving mass, force, acceleration, are

areas and pressure.

7.1 Defines force.
7.2 Defines momentum as the product of mass and velocity.
7.3 States that the formula F = kma is a mathematical representation of Newton's law that force is proportional to the rate of change of momentum.
7.4 Uses the formula in 7.3 to define the newton as the uni unit of force.
7.5 Solves simple problems involving force, mass and acceleration.
7.6 States that gravitational force exists and leads to 'free-fall' acceleration.
7.7 States that the average acceleration due to gravity is approximately 9.81 $m/s^2$.
7.8 States that weight is the effect of gravity on a mass, and that the weight of one kilogramme is approximately 9.81 N.
7.9 Defines intensity of pressure as force per unit area
7.10 States that the fundamental derived unit is the newton per square metre and is called the pascal.
7.11 States that there is a pressure due to the atmosphere
7.12 Defines the bar as 100 000 pascals (100 000 $N/m^2$)
7.13 States that absolute pressure = gauge pressure + atmospheric pressure.
7.14 Solves simple problems involving force, area and pressure.

8. Solves problems involving work, energy and power

8.1 Defines work done in terms of force and distance moved.
8.2 Defines the joule.
8.3 Defines torque.
8.4 Defines work done in terms of torque and angle turned.
8.5 Draws graphs of force-distance and torque-angle turned and relates the area under the graph to work done.
8.6 Describes energy as a capacity to do work.
8.7 Names five different forms of energy

8.8 Gives examples of energy conversion devices.
8.9 States the law of conservation of energy.
8.10 Defines efficiency in terms of energy input and energy output.
8.11 States that power is the rate of doing work or the rate of transfer of energy.
8.12 States that the watt is the unit of power.
8.13 Solves simple problems involving work, energy and power.

9. Solves problems involving mass, specific heat capacity and temperature change.

9.1 Describes fuels as sources of energy
9.2 States that heat, being a form of energy, the unit for quantity of heat is the joule.
9.3 States that temperature differential decides the direction of transfer of heat energy.
9.4 Distinguishes between temperature and heat energy.
9.5 Defines the fixed points on the Celsius scale of temperature
9.6 Measures temperature using a mercury-in-glass thermometer.
9.7 Defines a change in enthalpy without change of state (i.e. sensible heat)
9.8 Defines specific heat capacity.
9.9 States that the unit of specific heat capacity is the J/Kg°C.
9.10 Determines experimentally the specific heat capacity of water.
9.11 Solves simple problems associated with mass, specific heat capacity and temperature change.
9.12 Defines conduction, convection and radiation.
9.13 Gives one example in each case of the transfer of heat energy by each of the processes given in 9.12
9.14 Discusses the use of insulation to conserve fuel in a heating installation.

10. Solves problems associated with the turning effect of a force.

10.1 Defines stable, unstable and neutral equilibrium.

10.2 Defines the moment of a force about a point.
10.3 States the principle of moments.
10.4 Defines centroid of a lamina and centre of area.
10.5 Sketches the position of the centroid of a symmetrical lamina such as a rectangle.
10.6 Determines experimentally the position of the centroid of a lamina composed of rectangles.
10.7 Determines experimentally the position of the centroid of a triangular lamina.
10.8 Defines centroid of a mass and refers to the centre of gravity.
10.9 Sketches the position of the centroid of symmetrical solids.
10.10 Determines experimentally the centroid of assymetrical solids.
10.11 Solves simple problems on levers and simply supported beam involving combined concentrated and distributed loads.

## C. STATICS

11. Solves problems involving two or three forces meeting at a point.

11.1 Defines a scalar quantity
11.2 Defines a vector quantity
11.3 States that force is a vector quantity.
11.4 Uses the notation $F \angle \theta$ to describe a force.
11.5 Resolves a force into horizontal and vertical components and deduces that $V = F \sin \theta$ and $H = F \cos \theta$, values of $\theta$ being restricted to the first quadrant.
11.6 Defines the resultant of two forces meeting at a point.
11.7 States that the components of the resultant are the separate sums of the components of the two forces.
11.8 States the theorem of the parallelogram of forces.
11.9 Solves simple problems involving two forces meeting at a point
11.10 Defines static equilibrium.
11.11 States that three coplaner forces in equilibrium must meet at a point or act parallel to each other.
11.12 States the theorem of the triangle of forces.

11.13 Solves simple problems involving the triangle of forces with the aid of Bow's notation.

## D. ELECTRICITY

12. Discusses the nature of electricity

12.1 Describes the structure of the atom and defines electron, proton and neutron.
12.2 Describes the 'shells' of electrons in the atom and the detachment of a 'loosely held' electron by some influence.
12.3 States that the free movement of electrons gives a current of electricity.
12.4 States that, for undirectional continuous current, free electrons must be available in all parts of a circuit.
12.5 Defines the terms 'conductor' and 'insulator' and gives three examples of each.
12.6 States that all conductors offer some resistance to the flow of an electric current.
12.7 Discusses the use of primary and secondary cells, and generators, as sources of electricity.
12.8 Selects preferred symbols appropriate to this unit, for the representation of sources, cells, resistors, and switches in an electric circuit.

13. Identifies the three main effects of an electric current.

13.1 States examples of an electric current being used for its magnetic effect.
13.2 States examples of an electric current being used for its chemical effect.
13.3 States examples of an electric current being used for its heating effect.
13.4 Identifies the effect being made use of in given specific cases, e.g. electromagnet, electroplating, electric fire, fuse.

14. Solves problems associated with simple electrical circuits.

14.1 States that the SI unit for current is the ampere.
14.2 States that one ampere is one coulomb per second,

that a coulomb is the unit for quantity of electricity and that a coulomb is composed of a specific and very large number of electrons.

14.3 Explains how a current flows due to the existence of a potential difference between two points in an electrical conductor.

14.4 Defines potential difference in terms of energy per coulomb and that the unit is the volt.

14.5 States that electromotive force is the energy per coulomb and that the unit is the volt.

14.6 Shows that since volts = joules % coulombs then joules = volts x coulombs and watts = volts x amperes.

14.7 States Ohm's law in terms of the proportionality of current to potential difference.

14.8 States that this constant of proportionality for a particular resistor is called the resistance and that the unit of resistance is the ohm.

14.9 States that the reciprocal of resistance is called conductance and that its unit is the siemen.

14.10 Solves simple problems using Ohm's law.

14.11 Describes the difference between series and parallel connections of resistors.

14.12 States that the current is the same in all parts of a series circuit.

14.13 States that the sum of the voltages in an external series circuit is equal to the total applied voltage.

14.14 Shows that for resistors connected in series the equivalent resistance is given by $R = R_1 + R_2 + R_3$--.

14.15 Solves simple problems involving up to three reistors connected in series, including the use of Ohm's law.

14.16 States that the sum of the currents in resistors connected in parallel is equal to the current flowing into the parallel network.

14.17 States that the potential difference (voltage) is the same across resistors in parallel.

14.18 Shows that for resistors connected in parallel the equivalent resistance is given by:

$$\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}\text{---------}$$

and that the equivalent conductance is given by
$G = G_1 + G_2 + G_3$-----

14.19 Solves simple problems involving up to three resistors connected in parallel by use of Ohm's law.

14.20 States that the power dissipated in a given conductor is the product of the potential difference and the current.

14.21 Uses Ohm's law to show that $P = I^2 R$

14.22 Calculates the power dissipated in simple circuits.

# THREE

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